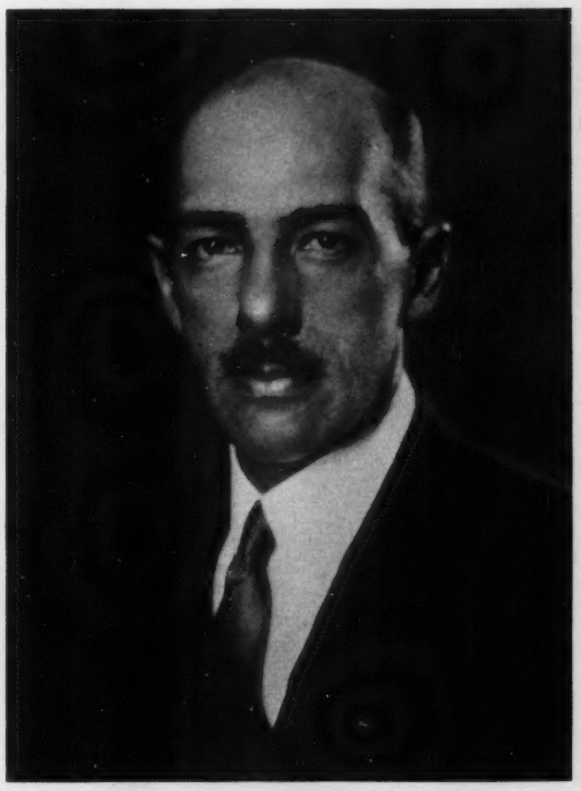
PENCIL POINTS

Volume XI April, 1930 Number 4

THE SKETCHES AND DRAWINGS OF EDGAR I. WILLIAMS

By Rayne Adams

EDGAR I. WILLIAMS' COLLECTION of sketches and drawings are impressive by reason of their urbanity and delicacy. In his architectural design he shows what most of us will agree to be an unerring good taste. Yet important as his work is, considered architecturally, it is the quality of his work as a draftsman which is of peculiar interest to us here. It takes little examination to appreciate the *habile* use of the pencil as shown in the two studies for the Metcalf House (p. 244). Although these two drawings are but preliminary sketches, with what sureness the shade and shadow are indicated. As in many of his pencil sketches we are conscious of deftness and economy. This facility in his architectural drawing must have been enormously indebted to his habit of sketching. During the years spent abroad in study, after winning the Rome Prize, Williams travelled much and sketched more. His interest was catholic and subjects of a thousand kinds found their places in his sketch books. And, since a slight biographical allusion has thus been made, it is fitting to make the story more complete. Williams was born in New Jersey in 1884 of French and English parentage. His professional work has its beginning with his entrance to the architectural course at the Massachusetts Institute of Technology in 1904. In 1909 he was awarded the Rome Prize. After some years abroad he returned to New York in 1912 and began his practice of architecture.



EDGAR I. WILLIAMS

While Williams is an architect, he has remained a draftsman; he draws and he knows how to draw. And it is from a contemplation of his sketches that I have been led to speculate on the relation of sketching to the life of a draftsman. If, perchance, there should be points of contact between the commonplace epitome which follows and the earthly pilgrimage of Mr. Williams, they are only such points of contact, adventitious in their nature, which are shared, for all I know, by all who come under the compulsion of the draftsman's pencil.

One begins, as you know, at a most immature and untarnished age, to draw men and ships and animals. The men wear tall stove-pipe hats belonging, roughly, to the fashion of 1830. The essence of a stove-pipe hat is length, and this subtle peculiarity is impressed upon us without our knowing. It is one of the data of consciousness as William James claimed Time to be. Similarly, without being told by our bothersome elders, we know that the head and body may be represented by *quasi*-circles; that the arms and legs are straight lines; that the fingers, usually four to the hand, radiate like the spokes of a wheel. The ships we draw are majestic steamboats, laden with huge clouds of helical smoke. The drawing of the best-loved of all our friends—the animals—is an episode of relative disaster; for, unlike men and ships, the animals, in their forms as in their lives, are elusive. Nevertheless, though the animals of the cave-man drawings are superior to ours, our early efforts share in the genius of these prehistoric sketches. They are drawn, for their substance, as much from our interior as from the external world. By the magic of the untrained imagination which only the very young possess, they are veridical. The triumphant period of our æsthetic life

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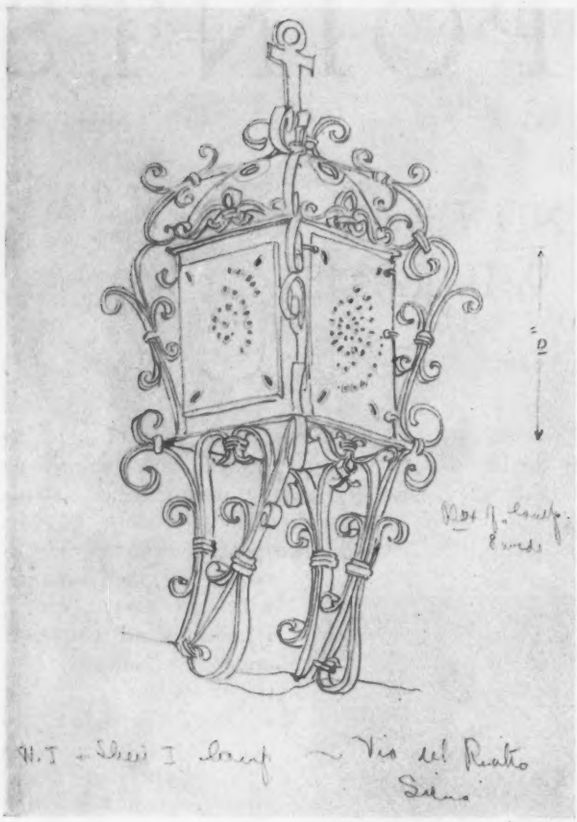


A WROUGHT IRON LAMP IN SIENA

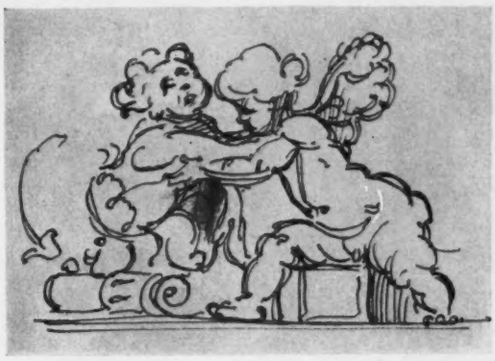
OLD COINS IN THE MUSEUM AT ATHENS

COPY OF A CARICATURE BY TIEPOLO

A WELL BALANCED FACCHINO

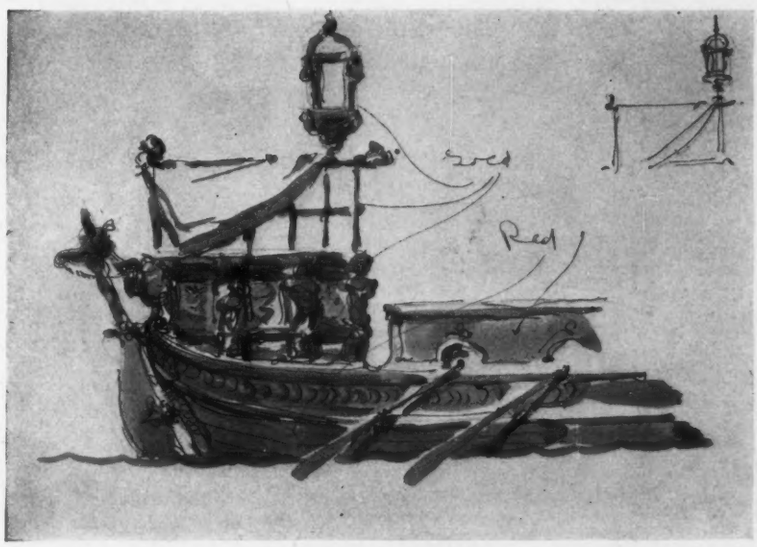
RANDOM SKETCHES FROM TRAVEL NOTEBOOKS

IN MYCENE, GREECE



A PAIR OF DELLA ROBBIA CHERUBS

A GREEK SUBJECT



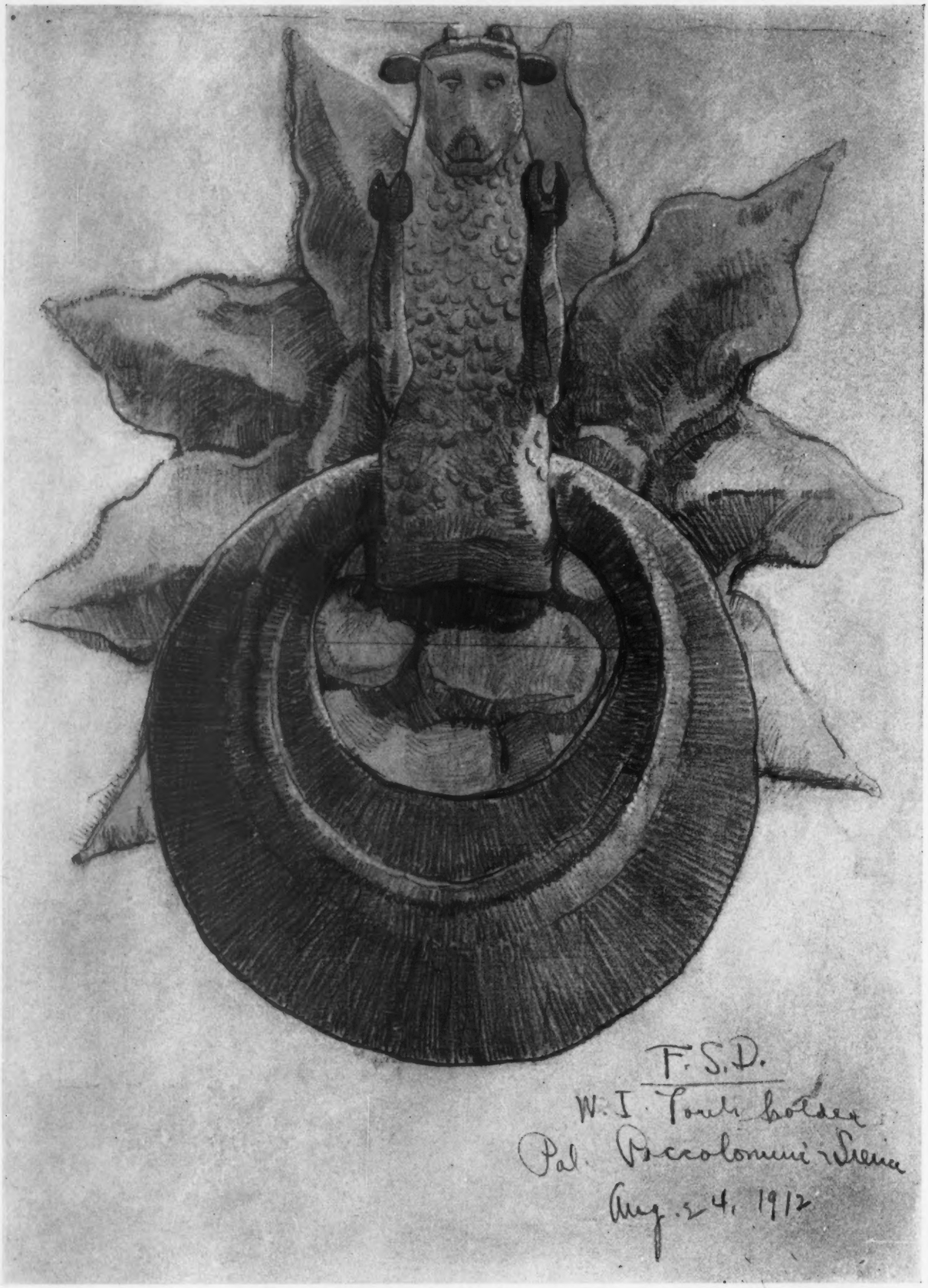
STERN OF AN OLD VENETIAN BOAT

IN THE CEMETERY, ATHENS

FROM ATHENS MUSEUM

ATHENIAN TYPES

RANDOM SKETCHES FROM TRAVEL NOTEBOOKS



FROM A PENCIL AND CHALK DRAWING ON BUFF PAPER BY EDGAR I. WILLIAMS

REDUCED FROM FULL-SIZE DETAIL OF WROUGHT IRON TORCH HOLDER, PALAZZO PICCOLOMINI, SIENA

Original measures 21" x 28"

opens the roads for the Anabasis of our hopes.

The roads, however, are not easily traveled. We are disillusioned of many things. We learn that a hand, to meet the requirements of convention, must have five fingers. And although there is strength in sophistication, yet we realize, however vaguely, that the fairyland dominated by our whim has been invaded. We learn that our drawings are not the counterparts of the things of everyday life. And thus, while we continue to draw, it is no longer with the abandon of genius.

GREEK MASK, ATHENS

Upon this early golden age follows the dark night. The young sketcher is sent to school and he is taught to draw. Instead, however, of drawing the marvellous creations of his whim, the phantasmagoria of illusion and truth—and drawing them in his own way—he is set to drawing rectangles, triangles, circles. This extravagant program is varied by an initiation into the mysteries of drawing conventionalized flowers: four open petals arranged methodically, like the Presbyterian Shorter Catechism. Perhaps the instructor may, following the play instinct which, as Mr. Spencer points out, underlies our æsthetic impulses, set the young student to drawing a conventionalized rabbit. And so, by easy stages, under the ægis of a darkening counsel, he passes from being a creator to a copier. For years he stays in this stygian box. He follows and is influenced by the momentary fashion in drawing. Beside him are students who, destined by inscrutable fate to become mechanical engineers, bookkeepers, and ranchmen, bent inertly over the drawing lesson. Everything is reduced to the level of unconscious banality. If he have, however, the persistence of the great—such persistence as was shown by the saints who walked from London to Jerusalem for an illusory communion with an illusory goal—he will persist. He will reach the age of fourteen, let us say, and he will have his first cultural introduction to the arts, sociologically considered.

We may easily picture his grandfather—who has made a competence merchandising no matter what—discussing with an ancient friend the marvels of Europe. He will learn of the arts—the paintings and architecture—of France and England and his æsthetic impulses will be stimulated and his courage hardened by such phrases as these:—

"When I was in Paris, I went straight to the Effel tower. First thing. You know, that tall tower they have in Paris, built out of iron? I went to the top. Then I went to the Lovre for two hours. Walked all through it. You know the Lovre?"

"Yes, I was at Lourdes."

"You know the place where the pictures are, the Lourdes?"

"I don't know what you mean."

"Well, it was worth while going to the Lovre. You can see there a lot of pictures I'd probably never see at the Metropolitan Museum. Pictures painted by artists thousands of years ago. . . . Then there was that place in London. What do they call it?"

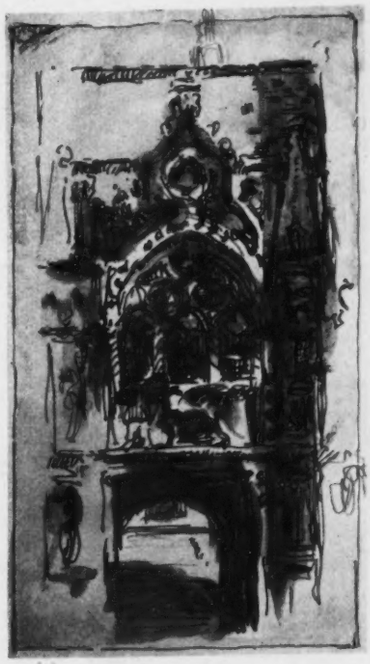
"You mean the Metropolitan?"

"No, the other place . . . yes, the British Museum; they've got a lot of pictures there. Interesting to know about those things. A man ought to know about art."

Thus Europe and thus Art. Against this background the rising star of the ambitious sketcher must make its ascent; it is the American scene, with all its stimulus to action. There is some value in drawing after all. So he continues. He wanders out into the fields and makes sketches of mountains and plains. Not knowing the difficulties involved, he makes a sketch of a whole mountain clad with an unending mantle of pine trees. He may even color it.

"We must send the boy to an art school; he will develop talent."

So he makes his bow to the plaster casts—those phantoms of the world of art. He makes a drawing of a huge ear or of a hand that might, for size, have belonged to Zeus on Olympia. He swims in sterility and believes he is on the track of Michelangelo. His soul is flattened and his ardor dimmed by the gray light filtering through unwashed windows upon the graveyard of plaster casts. Who said these things were beautiful anyway? That statue of Apollo, for instance?

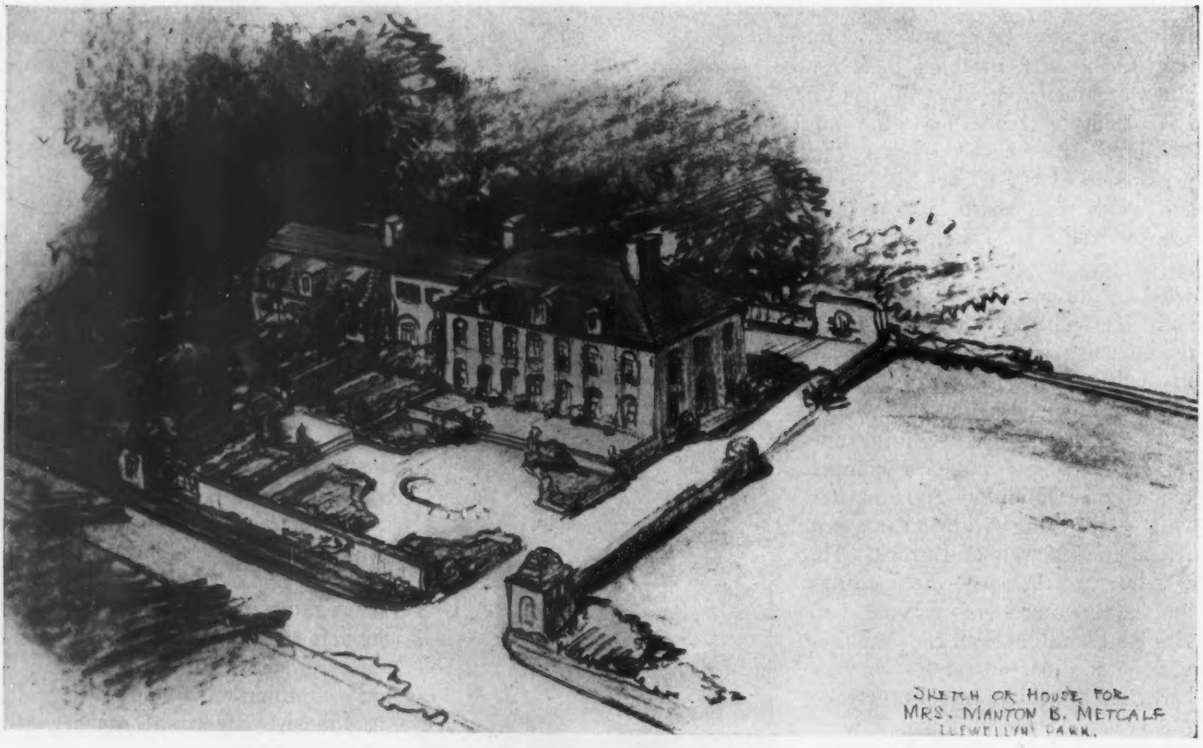


PALAZZO DUCALE, VENICE

Who shall interpret and who shall lead the way?

The years pass. He reflects; he is rebellious. Has he talent or hasn't he? If he devotes his life to art, can he make a go of it? The daily bread, imaged in a hundred ways before him, oppresses him with its insistent appeal. Well, at least he can compromise. He can become an architect. That, he understands vaguely, is a combination of the practical and the beautiful. He can paint the pictures of his fancy with his left hand while his dexter manages somehow to grasp the necessary commission. And, after all, as John Morley says, this is a world of compromise. . . .

Compromise? That depends. There are many instances just as there are many inventions. In the



TWO PRELIMINARY CHARCOAL STUDIES BY EDGAR I. WILLIAMS, ARCHITECT

DRAWING AT TOP MEASURED 26″ WIDE—THAT BELOW WAS 24″ x 16″

foregoing recital I have assumed that our hypothetical Jason was emotionally interested in drawing: that he believed that the graphic arts offered him the Golden Fleece. For such a one it is a compromise. There are, however, three classes of draftsmen: those who cannot help drawing; those who draw when they have to; and those who can't draw. Out of the raw material of these three classes architects are born, grow to maturity, and die. Some of those who are gifted may continue happily to express themselves emotionally through their sketches and drawings. And they may manage to do this somehow, in spite of the demands made on their time by their architectural practice.

PENCIL SKETCH BY EDGAR I. WILLIAMS
SANTA MARIA DELLA GRAZIE, MILAN, ITALY

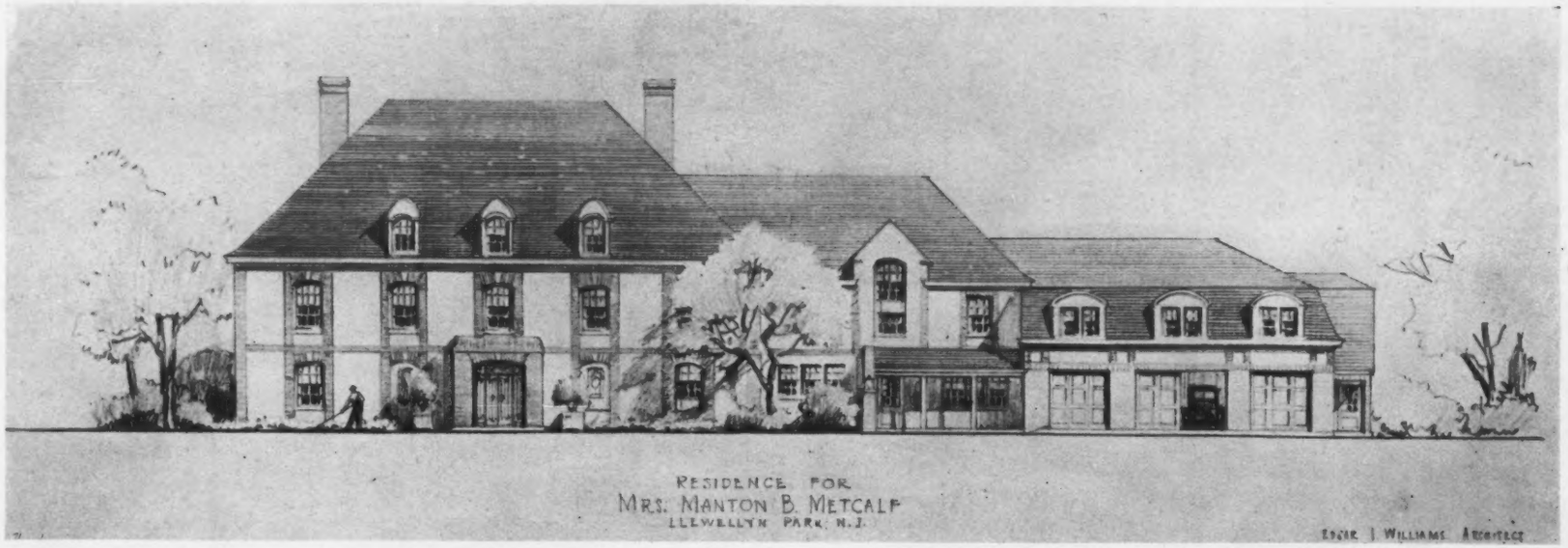
For how many of these, however, do the dreamy days of Rome and Florence seem far away. How dusty are their sketch books. If one only had time! And though he draws, he no longer draws only those things which appeal to his sense of whim; or his sense of beauty. He draws walls and windows according to the requirements of the Building Code. And this cessation of emotional expression marks the real Catabasis. It is the march down to the sea.

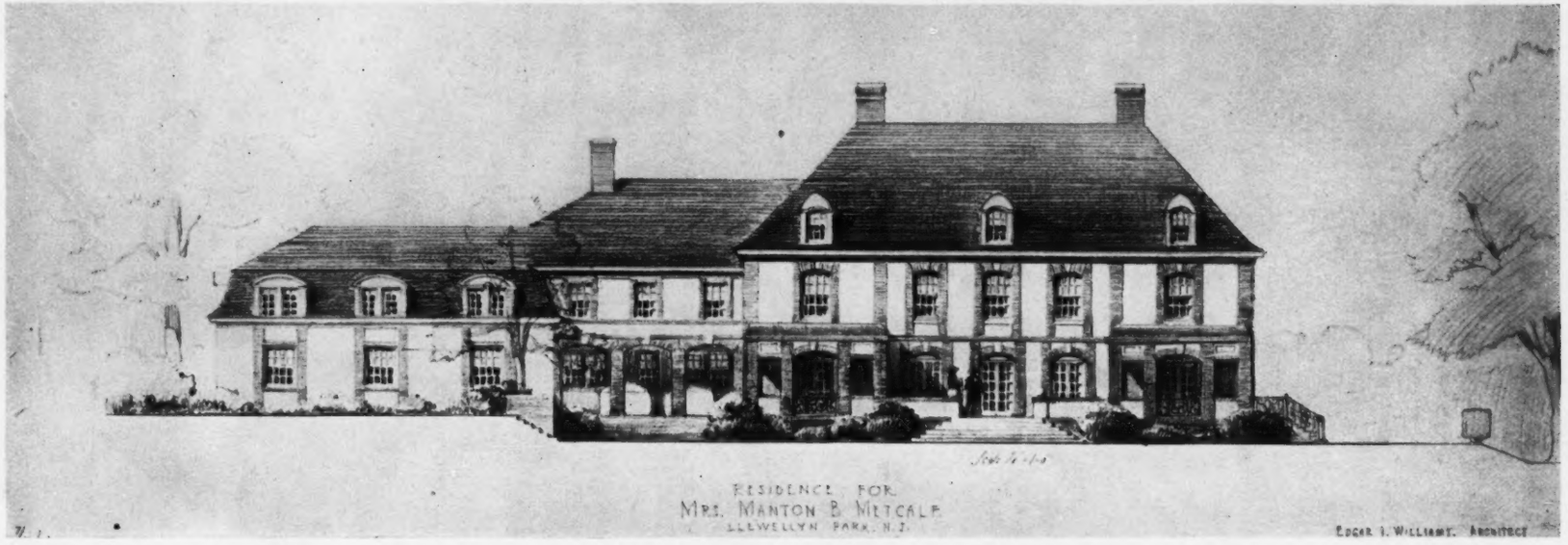
Why do we draw? Why do we wish to put down two dimensional forms on paper? Is it for the same reason that impelled the father of Anatole France's small Pierre to stuff all creation into his zoological cabinet—the mania of possession? It is because, by the sketch, we somehow effect a mystical marriage between ourselves and nature, so that our being is enriched? Or do we simply draw because we do?—a crude truism which may nevertheless express the ultimate reality better than a thousand qualifying phrases can do. And there is this relief to the confused mind of those who, aware that the road is long and hard, pause and wonder: if their work appears to them barren, yet it may have a moving significance for others—which is sociology.

Perhaps under the inspiration of some wise teacher—for there are such—our Jason may realize that sketching, after all, at its best, is an expression of the inalienable "whim." You may admire the *Virgin of the Rocks* of Leonardo, but will you, in the presence of all the hypothetical deities, place your hand on your heart and claim that it has more emotional stimulus than that given by the drawing of the child playing with a cat? Wondrous as it is, the *Virgin of the Rocks* is labored; the sketch is of the essence of play. It is genius of whim.

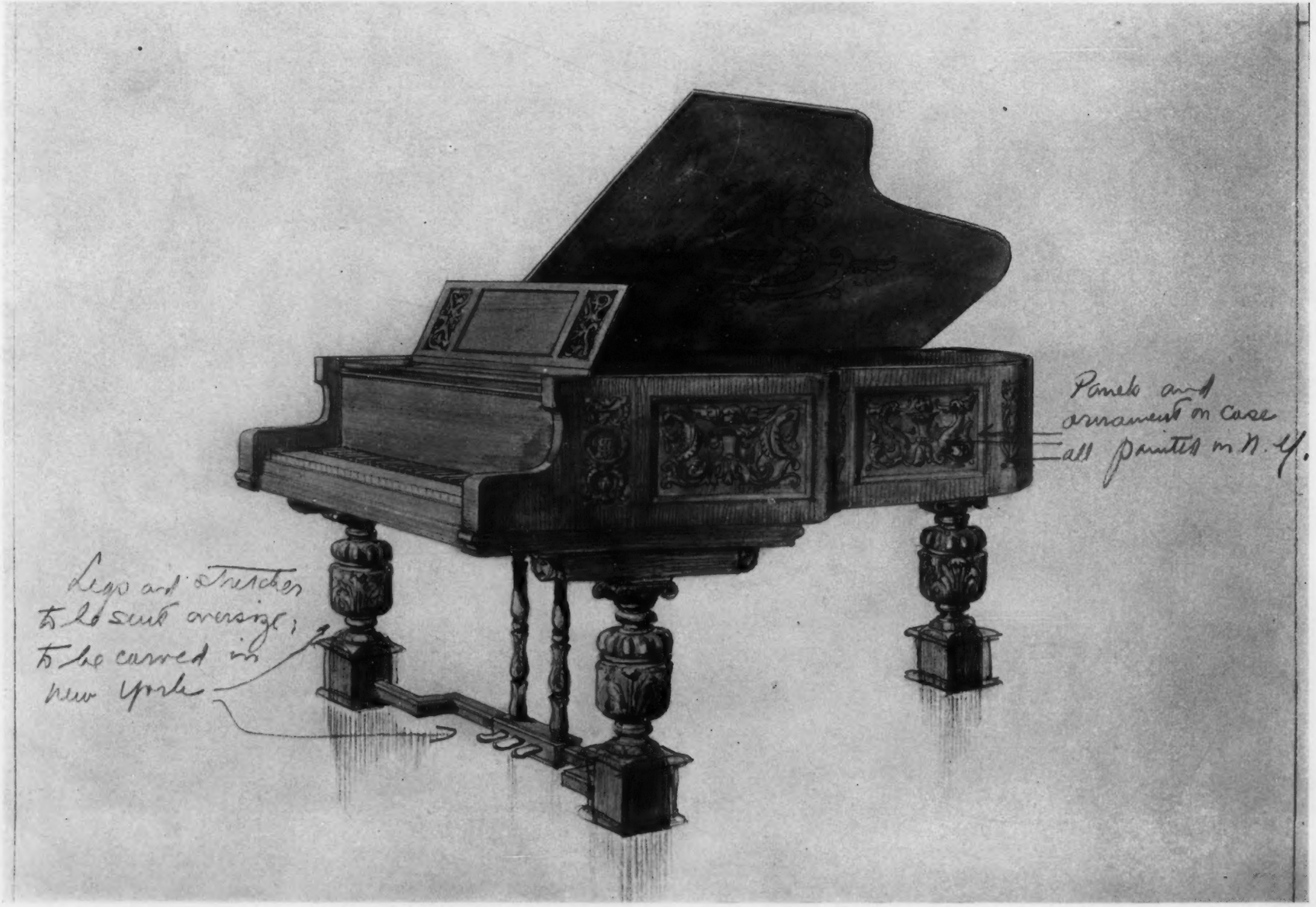
Every man—and it can hardly be said too often—

FROM A PEN-AND-INK AND COLOR RENDERING BY EDGAR I. WILLIAMS
TIMUQUANA COUNTRY CLUB, JACKSONVILLE, FLORIDA—WILLIAMS AND BARRATT, ARCHITECTS





EIGHTH-INCH SCALE ELEVATION STUDIES BY EDGAR I. WILLIAMS FOR THE RESIDENCE OF MRS. MANTON B. METCALF AT LLEWELLYN PARK, NEW JERSEY



PENCIL AND WASH DRAWING BY EDGAR I. WILLIAMS OF HIS DESIGN FOR A CARVED OAK PIANO CASE FOR MRS. C. R. HOLMES

FROM A CHARCOAL FULL-SIZE DETAIL OF A CARVED OAK PIANO CASE SHOWN ON PAGE 245
DESIGNED AND DRAWN BY EDGAR I. WILLIAMS AS DATA FOR THE WOODCARVER

FROM TWO CHARCOAL FULL-SIZE DETAILS BY EDGAR I. WILLIAMS
DECORATIVE PLASTER PANELS FOR RESIDENCE OF MRS. C. R. HOLMES
Originals measure 22" x 17½"

PEN AND INK DRAWING USED TO ILLUSTRATE GUY LOWELL'S "SMALLER ITALIAN VILLAS AND FARMHOUSES"

brings us, as Swinburne puts it, the message of his peculiar gospel. It is difficult for an actor to be compelling equally as a tragedian and a comedian. When those who are devoting their lives to the study of architecture travel among the ancient towns of Europe—what do they get? Only that which they bring. If their temperament be this—it is one thing; if that, it is another. The sombre notes of some of our most competent architectural draftsmen indicate a sort of invincible quality; they will get knowledge, by God! no matter what it costs. Fate made them that way. And they give us much—if we have open minds. There are others to whom the European scene presents a less bitter battle-ground. Dowered with a special grace, they give us perhaps less bread and butter, but more sunshine in which to enjoy it.

In the well-filled sketch books of Mr. Williams nothing is more noteworthy than his ability to catch and hold light things and slight. His sketches are gay; they lack the gravity which we associate with the fall of empires, death, and transfiguration. In the small sketch of an interior—one of the charming sketches reproduced in Guy Lowell's "Italian Villas and Farmhouses," and which is shown in this issue of PENCIL POINTS, there is a peculiar quality of intimacy and delicacy which is altogether charming. Note the economy of line. It is a drawing made, it is safe to say, on a day when he felt warmed quite through with the sunshine of Italy. Look at the tiny clock; the vase, the simple suggestion of homely peasant life. It is full of a certain whimsical quality. Serious and suggestive, it is a picture out of fairyland.

FROM A PAINTING AND A SKETCH BY LEONARDO DA VINCI, ALLUDED TO IN THE TEXT

ADVENTURES OF AN ARCHITECT

6—THE END OF A RAINBOW

By Rossel E. Mitchell

HE WAS A rosy complexioned young man, and I have often wondered if some psycho-analyst would find a connection between that and his rose-colored dreams! It took several years for me to learn that his spectacles, which appeared to be mere optical glass, were in fact rose-hued. Not literally, perhaps, but certainly that is the way he saw things. Above the average height, large framed, inclined to fatness, with clear blue eyes that looked straight at you, he was truly a likeable fellow. He possessed a certainty of touch in his conversation! I found later this also extended to the purses of numberless friends and victims.

We had met socially some years previously, and now he was embarked in a business which, to hear him tell it, promised riches for all concerned. He was president of the Bankers' Finance Corporation. The business of this corporation was to organize banks in communities not possessing proper banking facilities. He had just completed the "organization" of three banks, all going concerns. It was his purpose to "organize" another in a nearby community. (He always used the word "organize" in connection with his enterprises; the more usual "promote" being strictly tabu.) He wanted a capable architect to cooperate with him and had selected me. It is nice to be "selected" as a capable architect from among your competitors. Not that you are surprised at the honor, rather, you are at times distressed that others do not exercise the same good judgment!

His plan was simple and straightforward. Finding a community where banking facilities were needed, he would set about crystallizing sentiment. Selecting a suitable and available lot he would secure an option on it with a view to its purchase for a banking house. His architect was then to draw an arrangement floor plan and make an attractive picture of the proposed building, for exhibit to prospective stockholders. A less imaginative person would not have gone about things that way—and would have had less success. In many instances he found communities where some inexperienced local leader had attempted to promote a bank and failed. The failures were due in part to the fact that in communities where there is no large concentration of capital (usually new communities and suburbs) it takes a large number of small stockholders to raise sufficient capital to make a bank a success. To secure this large number of stockholders requires work, and the local citizen who attempts an organization finds this out, especially as his fellow-citizens are not at all inclined to pay him for his trouble. Town jealousies and factions also are apt to enter in, and these can be handled better by an outsider than by a local man. A prophet is still frequently without honor among his own countrymen, but the outsider who has the right personality, knows what he wants to do and, above all, understands human nature, can accomplish wonders where the local citizen runs against a blank wall.

Take the matter of a picture of a proposed bank building for an example of the human nature element. That is the last thing an inexperienced person would think of, and the first thing a professional promoter wants!

"Anybody knows what a bank looks like," growls your "practical" citizen, but—

"You gotta picture everything for 'em. Make 'em see it! Your average merchant, shopkeeper, or dealer has no imagination whatever. Show him a picture—something lifelike. Streets, autos, an attractive bank building suitable to the neighborhood; people walking *into* and *toward* the bank, not away from it. You gotta tell 'em that's what you're going to give 'em, right over there on that corner! Then pull out your stock subscription blanks and you can sign 'em up."

This from the successful promoter.

I contracted with him to make the necessary preliminary drawings, with the proviso that if the "organization" did not succeed I would lose my work, as he would lose his. If it did succeed, I was to make the construction plans and supervise the building for the usual commissions. The first bank was typical of many small communities some years past. Banking facilities badly needed, but local factions unable to get together. If Bill Smith started it, Jim Brown's faction would have nothing to do with it, and vice versa. Not enough capital could be obtained from one following to insure success, with the other factions out. With great finesse he got all factions represented on the proposed board of directors, and chose a president who fell for my picture. A Jewish merchant, not long from Russia, sent post haste for me. "Sendt me dot archeeteck," he ordered. He wanted a store built, but I had some difficulty in finding out what he meant by a "shood-in front." He was so captivated by my drawing of the bank that I was both flattered and curious. By chance I learned what struck him. The bank entrance was a large archway, deeply recessed in stone. From the top of the arch ceiling the sketch showed a chain suspending at a lower level a large ornate lantern. This lantern I had picked out in gilt. They told me Abe could not keep his eyes off of it.

"Vill you loog at dot? Shust like real goldt, aindt it?" Abe became a substantial stockholder and a valuable member of the board of directors.

The bank was "organized" rapidly, and has from the start been a successful institution. Others followed, and while the buildings were not elaborate or

very costly, the business was profitable and the clientèle desirable.

To us the building of bank buildings was a part of the routine, and the profits no greater than on some other kinds of work; but to the Bankers' Finance Corporation, the organization of banks was a bonanza. Twenty per cent. of the funds raised was retained by the "organizers." It was an era of expansion, and even that enormous discount from the assets did not prevent some of the banks from making money. It was inevitable, though, that the game should be overplayed. From promoting banks where they were needed, it was an easy step to promote them where they were not needed. Complaints began to pour into the State banking departments. A law was passed limiting bank promotion fees to ten per cent. Still the game went on. Like the merchant who advertises his goods to be sold at "half price," one imagines the profit must have been substantial indeed when he was selling them for full price!

The Bankers' Finance Company expanded. It began to take on other promotion enterprises. A baker wanted additional capital (most people do!) and the Finance Company undertook to secure it for him. A coal miner needed money to open up and develop his mine and they took that on. Blue sky laws were unborn, and the sky was the limit to what a glib tongued salesman would promise as the certainty of income to be had from whatever stock he happened to be selling that week. Of course there was only one certainty—it paid *him* an income when he collected $20.00 on every share sold and pocketed half of it!

Poor old Washington Irving rusts on the book shelves, and the lesson of the Mississippi Bubble has to be re-enacted millions of times, only to leave the public about as gullible as ever.

"Don't think prices won't fall again," counsels kindly old Irving.

"This stock should double in value in five years," assures the salesman.

When the peak is reached the decline begins before even the wiseacres sense it. Money "tightens up." Bankers begin to refuse good loans. As credit shrivels, buying falls off. Stock issues become unsalable, even for tried and true investments.

The president of the Bankers' Finance Corporation had been rolling in wealth. Luxurious motor car, fine new home, substantial gifts to charity. But promotion enterprises commenced to fade from the picture. Ugly rumors floated about. Suddenly, like a bolt from the blue, an indictment was brought against him. Unruffled and unworried, his pink face wreathed in its usual smiles, he declared the matter was all "nonsense." Events proved otherwise. Primarily a salesman himself, a careless auditor and auditing system had confused the funds of a National Bank with some industrial financing that had failed, and there was a shortage of funds to the bank's account. He offered to make the amount good, and the authorities permitted him to—then went ahead with the indictment. The truth is, they "had it in for him." Bankers were angry at the competition he had brought about and were now after his scalp. He was tried on a charge of violating the banking laws, convicted and sentenced to a brief term in prison.

The State Solicitor General happened to be a man of character and knew our rubicund friend personally. He determined to secure his pardon from the Governor, and quietly went to work to prevent him having to serve a day in jail. Night after night he worked personally on the case, not trusting anything to a subordinate, who might let something out and thus bring about counteracting political pressure. One day he sent for the sentenced man, exhibited the result of his labors and said, "This is timed to go to the Governor in three days. I will present it to him *myself*. Ten days later, before your sentence begins, you will be a free man."

The following night the Solicitor General fell dead among his books and papers at his office.

Thus ended the Bankers' Finance Corporation.

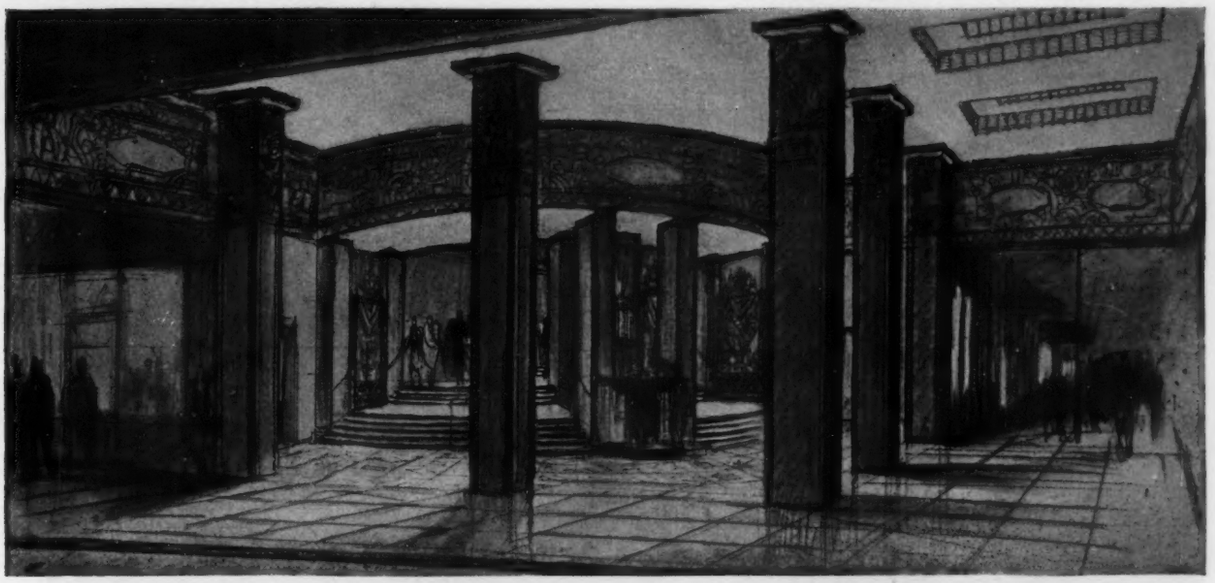
The aftermath was interesting also. Upon being released from prison, still pink and smiling, although of greatly reduced girth, our ex-president betook himself to another state to start life anew. In less than a year he learned of a big bank that was about to go under. Making a quick investigation, he became convinced the situation could be saved. Asking to be allowed to appear before the Board of Directors, he quickly outlined a plan by which a crash could be averted and the bank continue in business. Confronted by the statement of the bank president that his plan "would never get anywhere with the State Banking Department," he exhibited a letter from that very department, signed by its head, endorsing his idea.

The Board grasped the opportunity like the drowning man the straw, and our "organizer" set to work. By clever manipulation and a tremendous amount of personal effort he untangled the situation within ten days to such an extent that the State Banking Department withdrew its threat to close the institution. In another ten days the bank was completely reorganized, new capital and backing secured, and in less than thirty days the entire storm had "blown over."

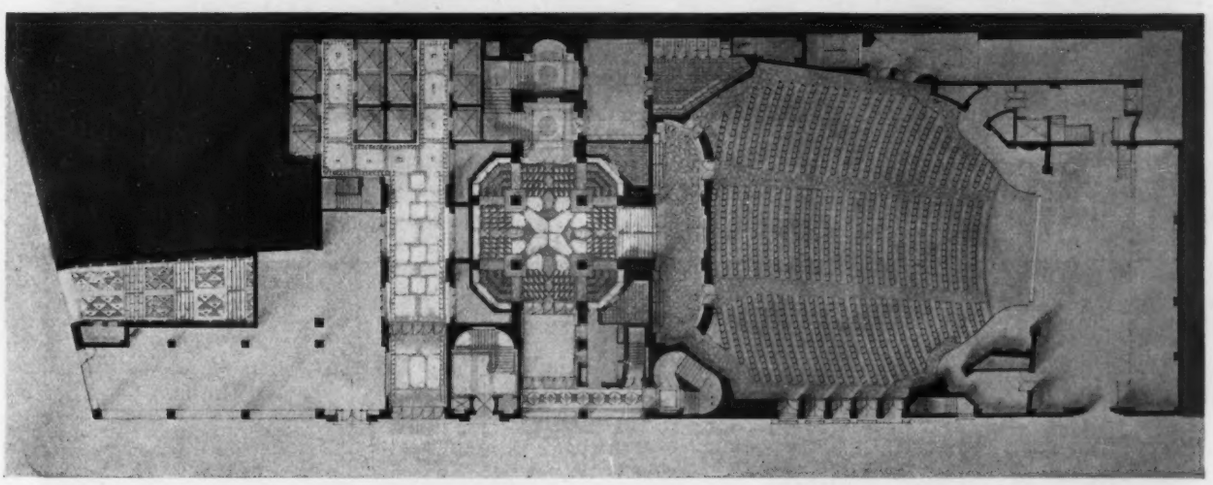
Our "jailbird" got a magnificent letter from the State Banking Department, praising his work and success.

I never heard him make but one comment on his year spent behind the prison bars. It was this:

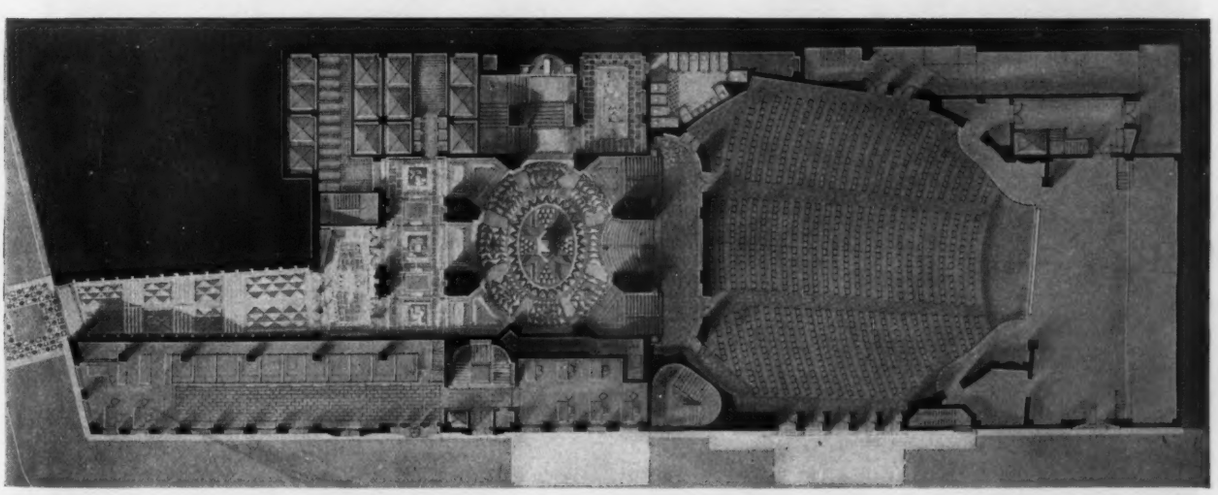
"You know what's a fact? I met more bankers that year than any other kind of people!"



AN EARLY SUGGESTION FOR A CORNER ENTRANCE AND ARCADE



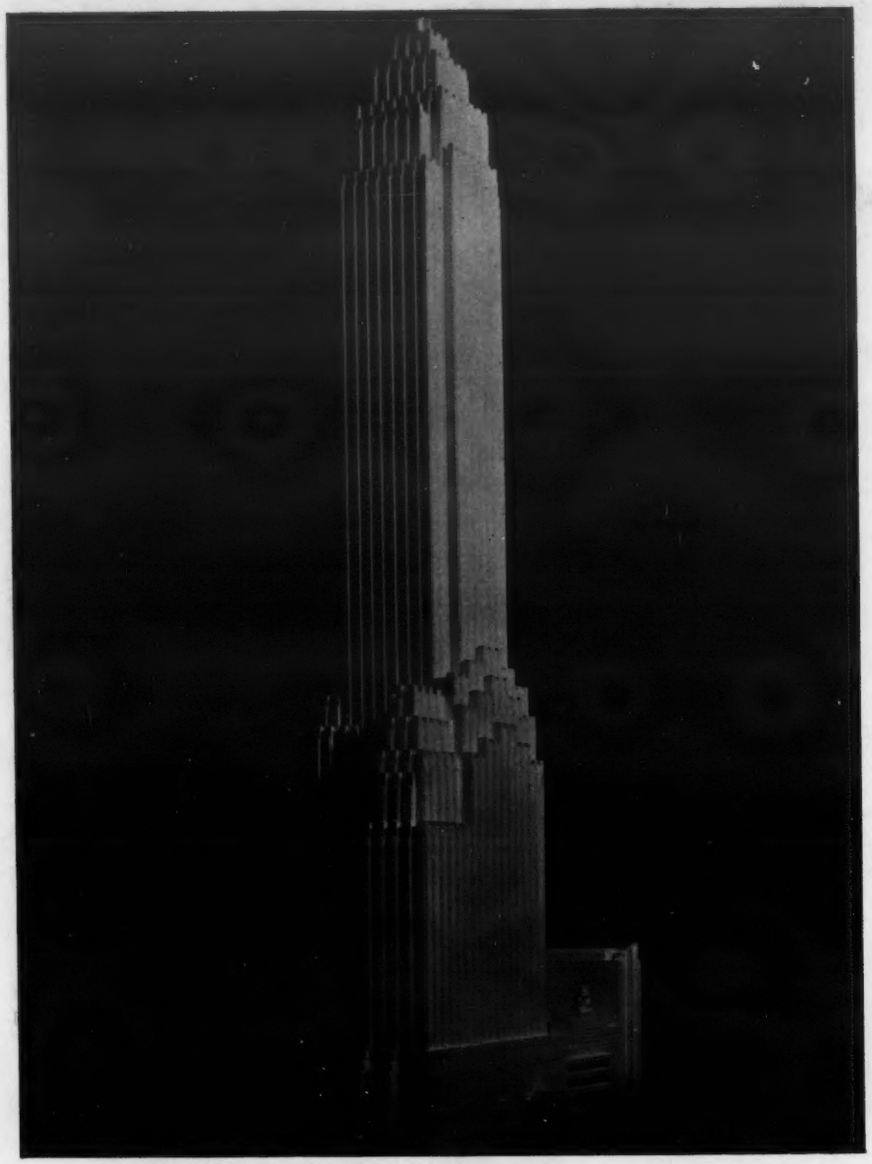
PLAN AT GROUND FLOOR SHOWING ENTRANCES TO OFFICE BUILDING AND THEATRE—LOUNGE AT STREET LEVEL



PLAN AT GRAND FOYER LEVEL SHOWING ALSO THE BANK

STUDIES FOR AN OFFICE BUILDING AND THEATRE—DRAWINGS BY JACQUES CARLU

Carlu & Boyle, Architects—Warren & Wetmore, Consulting Architects



PLASTER MODEL FOR A SIXTY-FIVE-STORY OFFICE BUILDING WHICH INCLUDES A TWO-THOUSAND-SEAT THEATRE

Carlu & Boyle, Architects—Warren & Wetmore, Consulting Architects

THE CAÏUS CESTIUS PYRAMID IN ROME

FROM A WATER COLOR DRAWING BY JACQUES CARLU

PENCIL POINTS SERIES
of
COLOR PLATES

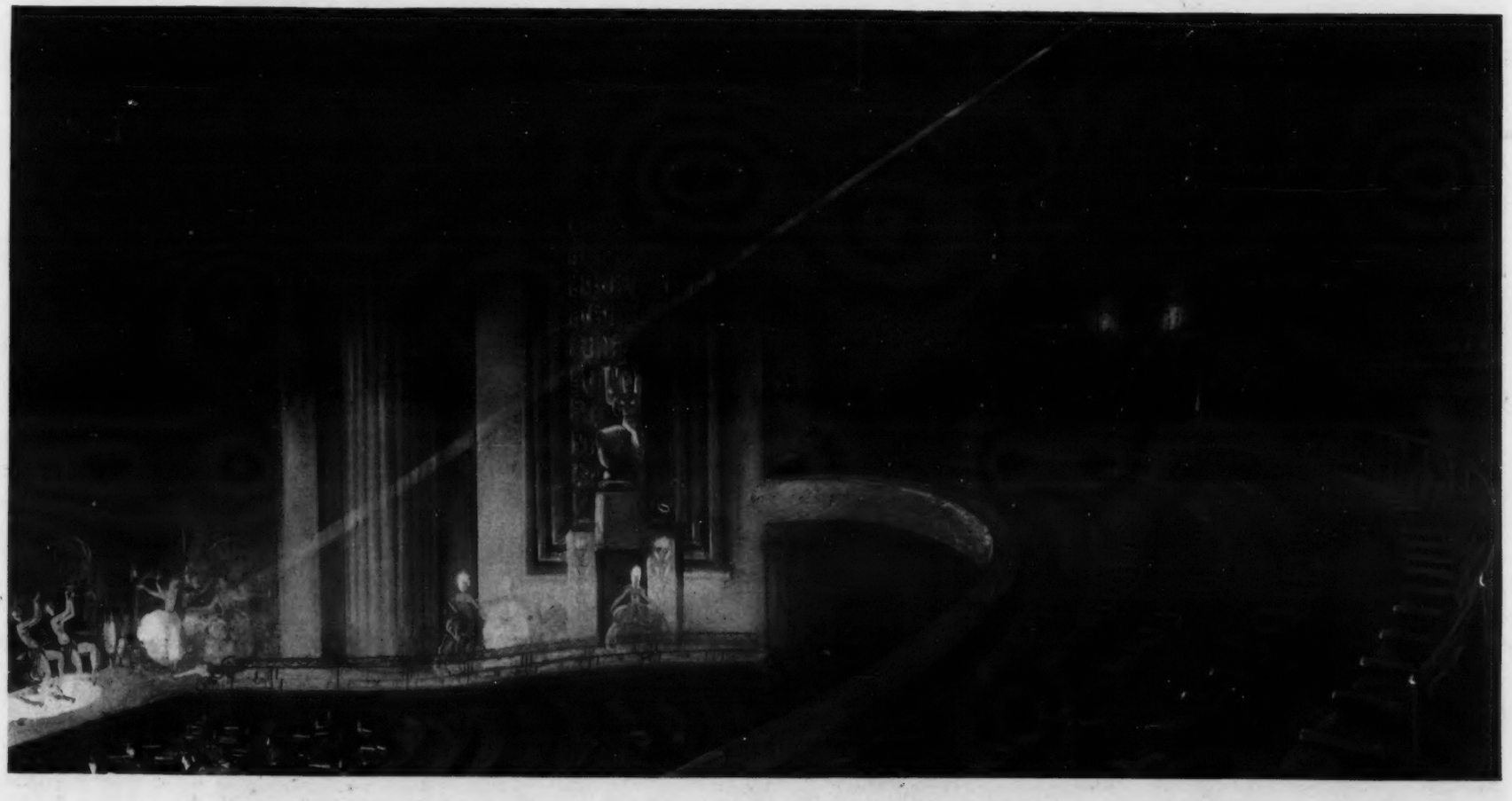
This drawing by the distinguished French architect, Jacques Carlu, was made on medium rough water color paper with both transparent and opaque colors. The original measured 19" x 12½". It was done in 1922 while M. Carlu was in Rome as a "Grand Prix" at the French Academy. This particular example of his skill as a water colorist is notable for its rich color harmony and its composition. A long article on M. Carlu, with which were illustrated a number of his drawings, was published in PENCIL POINTS *for May, 1926.*

A SKETCH BY JACQUES CARLU—EARLY STUDY FOR A CIRCULAR FOYER GALLERY
FOR A TWO-THOUSAND-SEAT THEATRE IN A SIXTY-FIVE-STORY OFFICE BUILDING
Carlu & Boyle, Architects—Warren & Wetmore, Consulting Architects

STUDY FOR THE GRAND FOYER OF A PROPOSED TWO-THOUSAND-SEAT THEATRE IN A SIXTY-FIVE-STORY OFFICE BUILDING

PERSPECTIVE DRAWING IN GOUACHE BY JACQUES CARLU SHOWING ACCESS UP AND DOWN TO BALCONY AND ORCHESTRA FLOORS

Note that the light comes from behind wall panels of cast glass—Carlu & Boyle, Architects—Warren & Wetmore, Consulting Architects



PERSPECTIVE SKETCH STUDY BY JACQUES CARLU FOR A TWO-THOUSAND-SEAT THEATRE IN A SIXTY-FIVE-STORY OFFICE BUILDING

THIS STUDY SHOWS THE SIDE OF THE PROSCENIUM OPENING WITH ITS ORGAN SCREEN OF PIERCED GLASS

Carlu & Boyle, Architects—Warren & Wetmore, Consulting Architects

From "New Dimensions," by Paul T. Frankl

A DRESSING TABLE COMPOSITION IN SILVER BY PAUL T. FRANKL

The work of an American designer who is the originator of the "skyscraper bookcase," this example indicates French inspiration. On the wall is a German paper with a design of crossed shaded lines not accented so as to be obtrusive, but strong enough to avoid monotony. All the forms are simple, and without ornament or mouldings. The snakeskin pattern of the chair upholstery is the only ornament. One would not grow tired of a room such as this: one cannot say the same of the work of those designers who try in any one example to use "the whole bag of tricks." A visit to almost any recently built moving picture house forcibly brings to mind the old adage, "it is what is left out that makes a work of art," and the atelier quip, "the best work is done with the rubber."

DESIGN IN MODERN ARCHITECTURE

4—THE MODERN INTERIOR

By John F. Harbeson

"SIMPLICITY IS THE KEYNOTE of modernism, but there are certain other characteristics that help to make a thing modern. These could be summed up as follows: continuity of line (as we find in the streamline body of a car or in the long unbroken lines in fashions), contrasts in colors, and sharp contrasts in light and shadow created through definite and angular mouldings and by broken planes. Things modern also have in them a definite rhythm such as we find in modern dancing and music and in the frank accenting of form in fashions. They avoid imitation in material."

"We have brought forward the fact that simplicity seems a characteristic of our time. But this is only a surface kind of truth, for simplicity is a kind of cover for the complexity within us. It is true that our clothes and our buildings and modern art are constructed on comparatively simple lines, with little ornamentation in detail, but . . . . life is more intricate and complex today than it ever was."—PAUL T. FRANKL, *New Dimensions.*

A HOTEL WAITING ROOM BY MLLE. RENÉE KINSBOURG

This is an example of the rather mannered type of modern work, with a search for eccentricities, though those in this example are mild compared to much that is now being done, especially in American work, by designers with insufficient training or minds not too well balanced. The various breaks in the ceiling at the top of the side wall are not all likely to be caused by constructive requirements, and do not seem an essential part of the decorative scheme. The small bookcase over the corner seat is so arranged as to ruin any book placed in it, because of the acute angles into which the books must settle by force of gravity, and has some corners too small to be used, too small to be cleaned, but large enough to collect dirt and dust. Nor does there seem adequate reason, æsthetically or practically, for making a chair with an arm projecting further on one side than on the other, in combination with a seat that keeps the knees from turning to one side easily. Attempts to be "different" are often mistaken for modern spirit but, without other values, will make work that, like the "whatnot" of a past generation, will be discarded by the next.

DINING ROOM DESIGNED BY MICHEL ROUX-SPITZ

This architect's work was much published in the "Concours" of the Ecole des Beaux Arts of the years just before the war—work that was always rich in character, able in design. Here is a room of which the architectural lines are simple, but in which, with the exception of the ceiling, the plain surfaces are enriched with veining, as in the walls, or tessellated as is the floor, and with a richly decorated panel behind the sideboard. The elaborate chandelier is a feature much less used in modern interiors than formerly. The furniture, while simple in line, is quite sophisticated.

From "Intérieurs au Salon des Artistes Décorateurs," 1929.

STUDIO OR OFFICE BY J. RUHLMANN AND A. PORTENEUVE, PARIS

A room truly modern in its simplicity, the only decoration being the border of the rug, the decorative wall map in which the main background color is almost the same in value as the color of the walls—and the people who use it. For the architecture of the room is treated as a stage setting for the actors who are to use it, and so is conceived without extraneous elements that might draw attention from the "actors." A room of great height, the lighting is concealed by a shelf-like projection just above the eye-level. The furniture is simple, but comfortable—there are no interlaced triangles, no chevrons, nothing that is bizarre.

STUDY BY P. MONTAGNAC

Walls and ceiling are simple, and plain carpet on the floor, but over this is a rug of contrasting colors in "modern" design based on primitive or peasant art. The furniture, like the room, is simple in line, but not so in detail. It is made of several kinds of wood, with various kinds of grain, some of highly burled character, and with inlays. The chair upholstered in a designed textile is a little clumsy in design compared to the other.

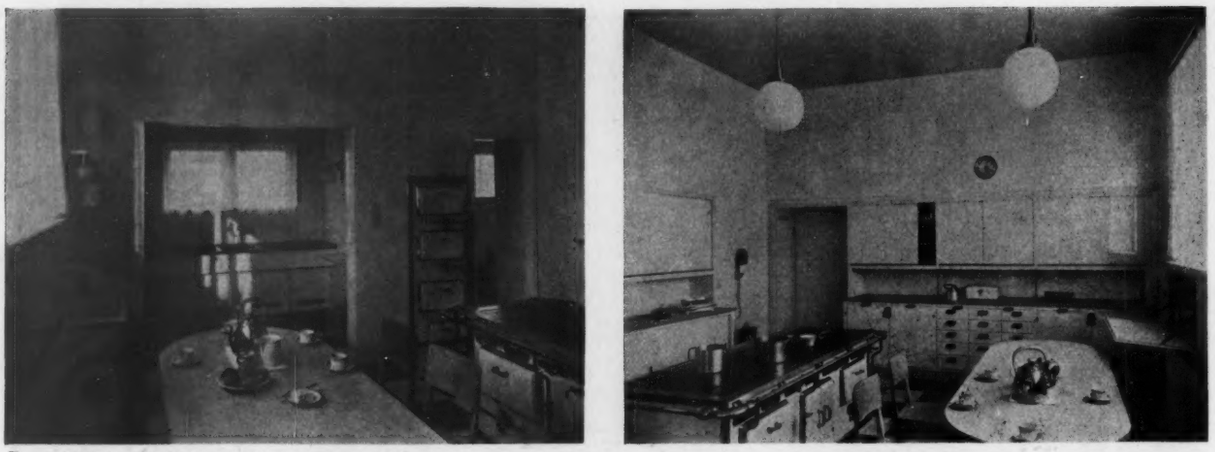
Interior architecture has always been less formal than exterior: there is less expression of the structural members or processes, which are usually concealed so as to make an interior comfortable, convenient for use, and easy to keep in order. Designers have frequently used the orders in interiors, often in the standardized stone proportions, as shown by the work of the Adam brothers, and in such widely used books on design as the *Recueil* of de Neufforge. But there have always been those—especially at school judgments—who object, for instance, to the use of a pediment in an interior, even when used decoratively, as being entirely out of place because that form originated as a roof to shed water.

Certain schools of modern thought, objecting to all "useless" forms, including forms intended purely for decoration, believe in simplicity at all costs. Some, like Le Corbusier, are quite willing, in some of their interiors, to have steam-pipes enter and leave a room unconcealed, in much the same fashion as on the ocean liner of a few years ago (before the days of such boats as the *Ile-de-France*).

Designers of this school eschew mouldings, care for few, if any, pictures, and prefer furniture of flat surfaces and strong lines in which "sentimental" mouldings, as they term them, are avoided, and panelling also, "in order to gain the effect of extreme and severe simplicity."

But not all modern designers subscribe to this simplicity: in the design of the interior as well as of the exterior there are a number of different movements of the modern. Those who have always been interested in ornament, and are skillful in the use of ornamentation, are irked by the principles of functionalism, of severe simplicity. For them the "modern" is simply a different "style" in which new forms are used as elements of composition. These designers often use as much ornament as was used in the past—as much sometimes as is found in florid examples of Louis XV style. The ornament is of a different kind, based on chevrons, triangles, or other geometric forms, on magnified plant forms, on forms of primitive art—forms that have developed from modern science or the mechanistic viewpoint of today.

Some modern work is "modern" only in the type of ornamentation, and if this were replaced by the ornamentation of fifteen years ago, the work would not be modern. In other words, the work is not modern in



From "Moderne Bauformen," December 1929.

KITCHEN OF HOUSE IN STUTTGART. BLOCH AND GUGGENHEIMER, ARCHITECTS

Here is a truly modern interior—an interior of "machinery" of various kinds, each with a purpose, but arranged in so orderly a manner as to give an appearance of simplicity, as does the automobile.

any real sense, but is dressed in the clothing of the present fashion.

If the last generation used documents scrupulously, and often ended by making "period architecture," this generation uses documents omnivorously, voraciously, with no thought of attempting re-creation, with no desire for period archæology. Sometimes the thoughts so gained are well-digested, assimilated, and reappear with a new coating of the personality of the designer, so that though individual ideas may have been taken from Swiss peasant work, from negro art, from machinery, from Italian architecture, or what you will, there is a certain unity of scale, of method of handling material, by means of which the designer weaves this material into one creation.

To be able to use ideas in this way, to harmonize thoughts into a unified composition, is a great gift, and few there are who have it. Most designers are not able to assimilate dissimilar ideas and pass them through the factory of their own minds and turn them out as a homogeneous product; these, wanting to be modern, take thoughts of different kinds, ideas from different documents, with different "scales," with nothing, in fact, in common, and make them lie as bedfellows, and the result is more often than not painful to the eyes of the beholder.

A number of Germans made use of unusual documents and did work that was quite "modern" in spirit ten or more years before the war. Ludwig Hoffman, Bruno Paul, Peter Behrens, Otto Wagner, and others made a study of the Italian Renaissance, but sought picturesque variants of the art of that time, rather than copying, carefully, the accepted "best examples." But it was the Exposition of Decorative Arts in Paris in 1925 that brought the movement forcibly to the attention of America through the great number of American travellers who there saw, for the first time, an art entirely new to them.

The modern style is based on all previous knowledge, and draws where it will from all sources of inspiration, whereas the art of former times had little (comparatively) besides its own past to draw upon. The enormous increase in the number of books published, the improvement in illustration, in photography, has placed the entire storehouse of knowledge before the modern designer. Books on primitive art, on the peasant art of every country, scientific books, books of microscopic photographs, photographs of machinery taken by artists who there discovered a field worthy of

SON'S SLEEPING ROOM IN A HOUSE IN STUTTGART.
BLOCH AND GUGGENHEIMER, ARCHITECTS

A German example of the modern school of simplicity. Walls, floor, and ceiling are plain: the furniture without ornament, depending for its effect on proportion and on the finish of the surfaces. The reading lamp over each bed is of the tubular variety.

DINING ROOM BY PAUL FOLLOT AT THE 1929 SALON DES ARTISTES DÉCORATEURS

Here is a sophisticated, thoroughly studied modern design, based on a wide and understanding knowledge of past styles. There is recall here of Chinese, Louis XV, and primitive art, blended into a unity, and with a sure sense of proportion and color values. The lines of the architectural background are severe, even though the surfaces are covered with decorative painting.

their talent, are all spread before the designer looking for "an idea"; and designers have always been looking for ideas. We have now an embarrassment of riches, too many documents; and unfortunately some believe that if they do something that is "different" (or something for which the document is not generally known) the result is modern—and good.

As the new work becomes more familiar to the average eye the merit of mere strangeness will evaporate and work will be judged, as of old, on its intrinsic values.

We have said that in the theory of modern thinkers a room should be simple: and the smaller the room, the simpler should be the architecture of the room, for this is like the setting on the stage—"a setting too elaborate and too striking in color and design would immediately take the attention away from the actors and the lines in the play."* To often these actors, though a part of the final composition, are not considered as an element in the study.

There are two parts of any interior: the stationary part—the walls, with their doors and windows, the floor, and the ceiling—and the movable part, consisting of the furniture, the hangings, the draperies, lighting fixtures, and the small objects, and the people, without which the room does not fulfill its function.

For a small room the ideal foundation is a plain flooring of quiet color—a vulcanized wood floor, or a plain carpeting in gray, taupe, or black. There are, of course, "modern" carpets of intricate geometric design in contrasting colors, interesting in themselves as pieces of design, but usually ruinous in a room, and much too evident to fit into any composition in the subordinate place that the down-trodden floor must naturally remain in.

The ceiling should be plain, of tone and color lighter than the walls. A dark ceiling is apt to make a room look lower, a light ceiling higher, than it really is. While there are chandeliers in the "modern" style, made by applying new decorative forms to an old appliance, lighting in the modern spirit is, as much as possible, concealed, or flush with wall or ceiling, or is part of the movable furniture.

If the floor and ceiling are thus plain, it is on the walls that most attention is directed. Design is partly a question of form, proportion, and scale, and partly

*"*New Dimensions*," by P. T. Frankl.

a question of material. As the form is simple in the modern interior, the material plays an important rôle. The texture of a plaster wall is worthy of study; the veining of marble may in itself be a rich decoration of an unobtrusive kind; polished or waxed surfaces and the choice of stuffs and textiles assume importance. The commercial penetration into hitherto little known parts of Asia, Africa, and the islands of the sea, has brought into the market a number of new woods with interesting burls and figures, available in veneers for wall coverings and for furniture. The rich figurings of zebra-wood, tuyha wood, and macassar-ebony, to mention but a few, give to the plain surfaces of modern design a new interest, without any attempt at "ornamentation," as we usually term it. We shall next month look at modern ornamentation of the latter kind.

From "Moderne Bauformen."

PROSCENIUM, ODEON THEATRE, DORTMUND. STRUNCK AND WENTZLER, ARCHITECTS

A German example of modern work deriving its inspiration from peasant art, in drawing and color. The architectural composition is of simple surfaces, without mouldings or panels.

PROGRAM

AN OPEN ARCHITECTURAL COMPETITION

FOR THE DESIGN OF

AN EIGHT-ROOM HOUSE AND TWO-CAR GARAGE

The Designer may assume that the choice of Materials is at his discretion.

Authorized by THE PENCIL POINTS PRESS, INC.

[RUSSELL F. WHITEHEAD, *Architect and Editor,* has been appointed as Professional Adviser to prepare this program and to act as Adviser in the Conduct of this Competition.]

Participation in this Competition is not limited. PENCIL POINTS is appealing to the competitive spirit of all ARCHITECTS and DRAFTSMEN, hoping they will be inspired to produce designs of outstanding merit.

Contestants may submit any number of designs.

This Competition Closes at 6 P. M., Thursday, May 15th, 1930.

COMPENSATION TO COMPETITORS

PENCIL POINTS PRESS, INC., *agrees to pay to the Winners, immediately after the Award by the Jury the following Prizes:*

Premiated Design	$1000.00
Design placed Second	300.00
Design placed Third	200.00
Design placed Fourth	100.00

SIX MENTIONS

JURY OF AWARD

PENCIL POINTS PRESS, INC., *agrees that there shall be a Jury of Award composed of Five Architects, representing different sections of the United States.*

PENCIL POINTS PRESS, INC., *and the Competitors agree that the Jury of Award has authority to make the awards and that its decisions shall be final.*

PROBLEM

PROBLEM: *Mandatory.* The design of a distinctive and modern house with eight principal rooms, to be built of materials chosen by the designer. The occupants are to be a cultured man, his wife, two children of high-school age, and a servant. Provision shall be made for overnight guests and for genial hospitality.

The house is to be located in the suburbs of a city or in the residential districts of a progressive town, anywhere in the United States. The assumed geographical location to be stated on the drawing. The site is assumed to be in the middle of a block and the land to be level. The lot is rectangular and has a frontage of seventy-five feet (75′-0″) on the Street and a depth of one hundred and fifty feet (150′-0″). The Northerly end of the lot faces the Street. A restriction states that no house can be erected nearer than thirty feet from the highway property line and that no building may be placed directly on the other lot lines.

The total area of the first floor shall not exceed one thousand two hundred (1200) square feet, *including* the area of the garage and porches.

Provision is to be made for Living Room, Dining Room (separate or combined), Kitchen and Five Bedrooms. Four Bathrooms, one two-fixture Lavatory and Pantry are to be provided.

One of the Bedrooms and one of the Bathrooms are to be located on the first floor for possible use as maid's room or guest room. The necessary circulations are to be included. There shall be at least one Closet for each Bedroom, a Linen Closet and a Coat Closet. If cellar is to be used for other than utilitarian purposes accessible stairway shall be included.

A garage for two automobiles is required. It is assumed that the owner prefers that the garage be directly connected to the house.

CONSIDERATIONS OF THE JURY OF AWARD:

1. Evidence of the imagination and skill of the competitors.
2. The Architectural Merit of the design and the Ingenuity shown in the development of the plans.
3. Fitness of the design as a whole to meet the spirit and needs of the problem.
4. Practicability of Construction.

Excellence of Rendering, while desirable, will not have undue weight with the Jury, in comparison with its estimate of the Competitor's ability, if otherwise shown.

COMPUTATION OF THE TOTAL SQUARE AREA: Measurements to be taken from the outside of exterior walls, or porch foundations.

All square area figures will be carefully checked before designs are submitted to the Jury.

Designs exceeding 1200 square feet total first floor area will not be considered.

PRESENTATION, DRAWINGS: *Mandatory*. The following drawings are to be submitted:

1. *Perspective* of the residence, at the scale of one quarter inch equals one foot, heights to be measured at corner of building nearest the spectator, undeniably true, rendered in pen and ink, clearly indicating the character of the exterior finish and showing a scenic background which is in keeping with the limitations of the site.
2. *Plans* at the scale of one eighth inch equals one foot, of the *First Floor* and the *Second Floor*. The walls and partitions are to be inked solid black and the name and dimensions of each room lettered plainly to be read easily when reproduced at one quarter the size of the original drawing. Range, sink, cupboards and beds are to be shown.
3. *One Side* and the *Rear Elevation*, at the scale of one eighth inch equals one foot.
4. *Detail* of some *Exterior Feature* of the design at scale of one half inch equals one foot.
5. *Graphic Scales* must be shown.
6. The drawings shall be made in full black ink and shown on *one* sheet of white paper. Diluted black ink, color or wash; cardboard, thin paper or mounted paper is prohibited.
7. The sheet is to be exactly 26 x 39 inches. Single black border lines are to be drawn so that space inside them will be exactly 25 x 38 inches.
8. The drawing shall bear the title: *Design for an Eight-room House—The Pencil Points Competition*. It is to be signed by a Nom de Plume, or Device.
9. An itemized computation of the total square area together with a note stating the assumed geographical location is to be placed upon the drawing in a space not to exceed 4" x 1½", surrounded by single border line.

COMMUNICATIONS: *Mandatory*. As this is an open Competition it will be impossible to answer inquiries. Therefore, the contestants shall not communicate, on the subject of this competition, with the Professional Adviser, or with any other person in any way connected with it, either directly or indirectly.

ANONYMITY OF DRAWINGS: *Mandatory*. The drawings submitted shall contain no distinguishing mark, except the Nom de Plume or Device, which could serve as a means of identification. No competitor shall directly or indirectly reveal his or her identity to the Professional Adviser.

With each drawing there must be enclosed a plain, opaque envelope, containing the true name and full address of the contestant. The Nom de Plume of the contestant shall be placed on the outside of the sealed envelope. The envelope will be opened by the Professional Adviser, in the presence of the Jury, after the awards have been made.

DELIVERY OF DRAWINGS: *Mandatory*. The drawings submitted in this competition shall be securely wrapped, in a strong tube not less than 2½" in diameter, to prevent creasing or crushing, and addressed in plain lettering to *Pencil Points Press, Russell F. Whitehead, Professional Adviser, 419 Fourth Avenue, New York, N. Y.* No other lettering shall appear on the wrapper. Contestants sending drawings by registered mail must obliterate the return name and address and not demand return receipt.

Drawings shall be delivered to PENCIL POINTS office or placed in the hands of the Post Office not later than 6 P. M. Thursday, May 15th, 1930. The postmark will serve as evidence.

Drawings submitted in this competition are at the competitor's risk. Reasonable care, however, will be exercised in their handling, keeping and package for return.

EXAMINATION OF DESIGNS: The Professional Adviser will examine the designs and records of their receipt to ascertain whether they comply with the mandatory requirements of the Program and will report to the Jury any instance of failure. The Jury will satisfy itself of the accuracy of the report and will place out of the competition and make no awards to any design not complying with mandatory requirements. No drawing shall be exhibited or made public until after the Award of the Jury.

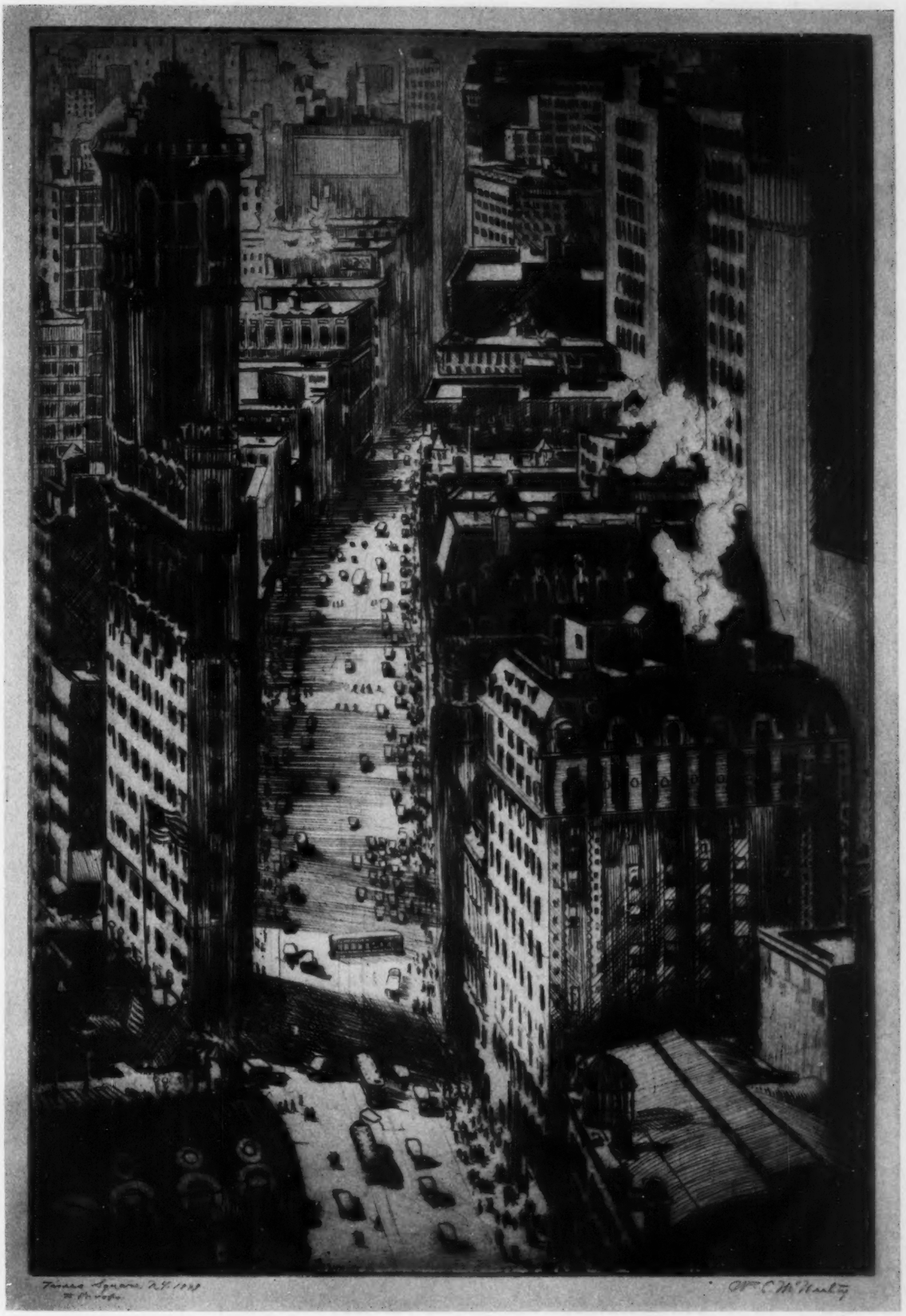
JUDGMENT: The Jury of Award will meet shortly after the close of the Competition.

ANNOUNCEMENT OF THE AWARDS: The Professional Adviser will send, by mail, the names of the winners of the Prizes and Mentions, to each competitor, as soon as possible after the awards have been made and the envelopes have been opened. The announcement will also be published in the July issue of PENCIL POINTS. Requests for this information by telephone and telegraph will not be answered.

REPORT OF THE JURY: The Jury will make a full report, stating the reasons for the selection of the winning designs and offering helpful criticism and comment upon designs not premiated. This report will be published in PENCIL POINTS along with the reproductions of the winning designs and such additional designs as may be selected.

THE PRIZE DESIGNS: Are to become the property of PENCIL POINTS and the right is reserved by this publication to publish or exhibit any or all of the designs not premiated. In every case where a competitor's design is shown his or her name and address will be given.

RETURN OF DRAWINGS: The Authors of non-premiated designs will have their drawings returned within a reasonable time, postage prepaid, insured for $50.00.



FROM A DRYPOINT BY WILLIAM C. McNULTY

TIMES SQUARE, NEW YORK

PENCIL POINTS FOR APRIL, 1930

VOLUME XI NUMBER 4

The original drypoint from which the reproduction on the reverse of this page was made measured 7¼" x 10½". It was shown recently in New York as one of the Fifty Prints of the Year chosen by John Sloan for the American Institute of Graphic Arts from among nearly a thousand prints submitted.

GARDEN GROUP BY ORONZIO MALDARELLI, SCULPTOR
"A SON OF NEPTUNE"

PENCIL POINTS FOR APRIL, 1930

VOLUME XI NUMBER 4

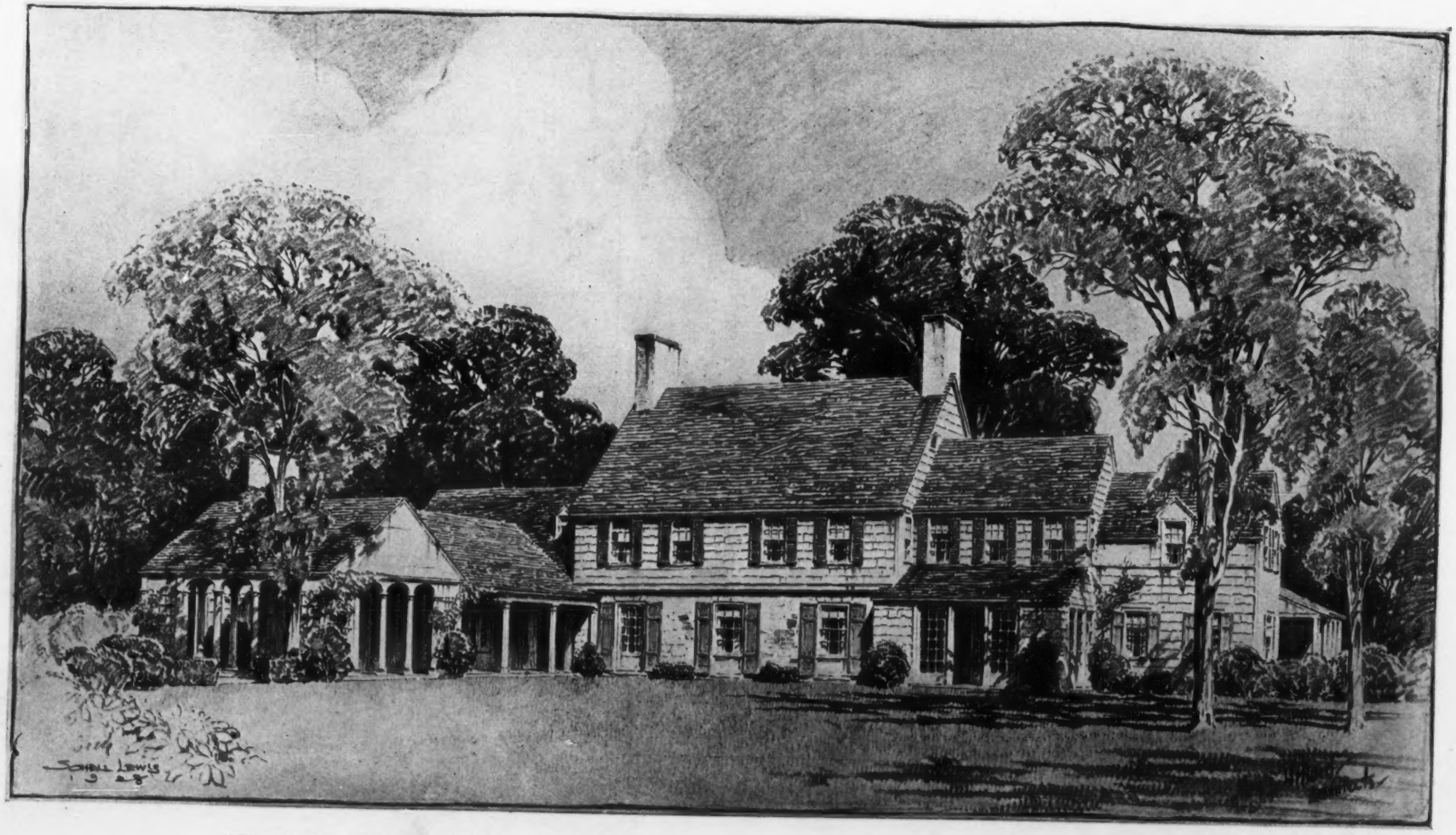
The bit of garden sculpture shown on this plate is a companion piece to the other group by Mr. Maldarelli published in the July, 1929, issue of PENCIL POINTS *on page 474. Like the other, this subject is designed to be cast in either bronze or lead and stands 31" high. This reproduction was made from a photograph of the plaster cast in the sculptor's studio. The piece was exhibited in the Garden Club section of the International Flower Show held last month at the Grand Central Palace in New York.*

THE CAPITOL FROM THE FORUM, ROME

FROM A WATER COLOR DRAWING BY JACQUES CARLU

PENCIL POINTS SERIES
of
COLOR PLATES

Jacques Carlu, who is Professor of Architectural Design at the Massachusetts Institute of Technology and Director of the American School at Fontainebleau, is represented in this issue by two color plates and several black and white reproductions of some recent architectural designs. The water color shown on this plate measured 19½" x 13" in the original and, like its companion, was done in Rome in 1922 while the artist was pursuing his studies as holder of the Grand Prix de Rome in Architecture. It was done almost entirely with transparent water colors with a few touches of gouache.

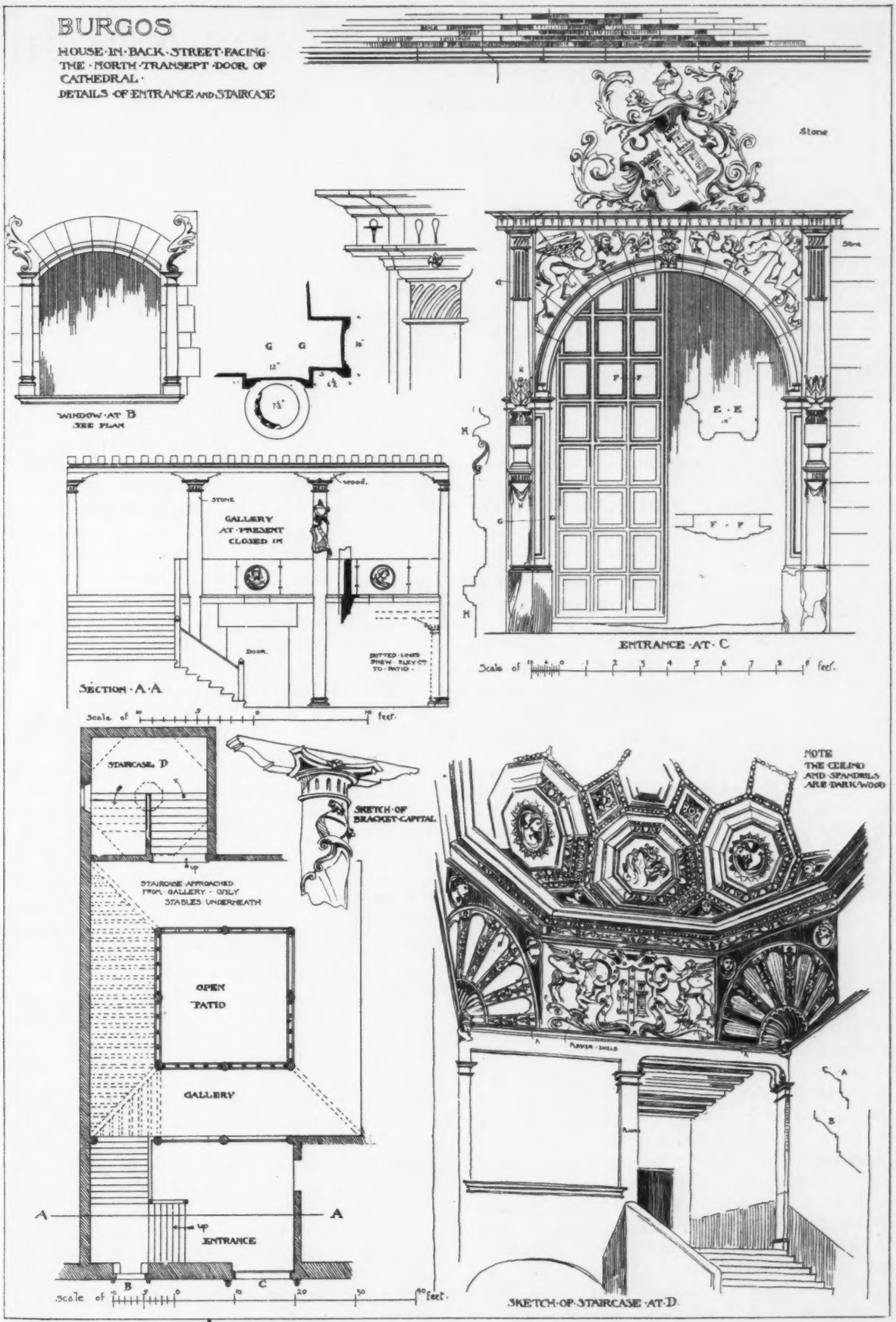


PENCIL RENDERING BY SCHELL LEWIS—REAR VIEW OF PROPOSED HOUSE IN DUTCHESS COUNTY, NEW YORK

MAY AND HILLARD, ARCHITECTS

PENCIL POINTS FOR APRIL, 1930
VOLUME XI NUMBER 4

It is interesting to compare the foliage in this drawing by Schell Lewis with that in the rendering by Louis Kurtz, reproduced on page 189 of the March issue. Another drawing by Mr. Lewis of this house, showing the rear view, will be published next month.



RENAISSANCE ARCHITECTURE AND ORNAMENT IN SPAIN

A PLATE FROM THE WORK BY ANDREW N. PRENTICE

PENCIL POINTS FOR APRIL, 1930

VOLUME XI NUMBER 4

"This is another ancient house (now used as a store) the history of which seems to be entirely forgotten. The detail is very beautiful and of the best Plateresque period. The plan is a very usual one, with a large doorway permitting entrance on horseback. The rich 'artesonado' roof to the staircase has plaster shields bearing the same arms as are shown over the entrance door."

A. N. PRENTICE.

THE GEOMETRY OF ARCHITECTURAL DRAFTING

9—PRINCIPLES AND PROPERTIES OF SCALES

By Ernest Irving Freese

EDITOR'S NOTE:—*This article, which is copyrighted, 1930, by the author, continues the series begun last August.*

JUST SUPPOSE you knew *nothing* about a scale, nor possessed any knowledge of the geometric principle upon which it is founded. All right. You are required to lay out the plan of a proposed structure. This plan, in order to come within the limits of your drafting board, must be drawn, say, at 1/48th full size, that is, the distance between any two points on your drawing must measure 1/48th of the corresponding dimension of the building. One of the required dimensions of the building is 43′-7″. To find the length of the corresponding line on your drawing, you'd divide 43′-7″ by 48. But you certainly wouldn't do it by "mental" arithmetic. You'd set down the 43, *multiply* it by 12, *add* 7, and finally *divide* by that 48. After this arithmetical detour, and after going over the route a time or two more to discover whether or not you were right the first time, you'd probably conclude to represent that distance of 43′-7″ by a line 10 43/48″ long. In the same manner you'd divide every other given or controlling dimension of the proposed building by 48 in order to find the length of line to proportionately represent it on your drawing. And then what? Well, then you'd go hunting—for a *rule* that would read to 48ths of an inch. Assuming that you were fortunate in that respect, *then* you might proceed to lay out the plan from the table of calculated dimensions you had prepared for that purpose. And you might *not*. Possibly the value of the ground upon which the originally proposed structure *was* to have been erected, had, due to the elapsed time factor, increased to such an appreciable extent that an economic return on the investment *now* demanded a more extensive structure to be erected thereupon.

Of course, the above is simply an entertaining and forcible illustration of the value of the *drafting scale* as an instrument of *proportionate measurement*. This instrument, once the "scale" of the drawing is determined upon, immediately yields the length of line required to represent any actual dimension. The drafting scale is the most indispensable and least understood instrument in the modern draftsman's kit of tools. It possesses other properties, aside from the one outstanding property of proportionate measurement, that are equally expeditious but less commonly utilized. And there are other scales, of differing types, which, though not as well known as they should be, are of immense value, both from the standpoint of *speed* and of *precision*, when the occasion for their use arises.

Any scale, of any type whatsoever, is purely a graphic, or geometric, *short cut* by means of which the value sought is directly obtained by *sight* instead of by tedious and time-consuming calculation. A thorough concept of the functions and properties of scales, coupled with working knowledge of how and when to use them, is the most speed-productive asset that a draftsman can acquire. The four types of scales that are herein considered and fully exemplified are the *drafting* scale, the *diagonal* scale, the *conversion* scale, and the *comparing* scale. The nominations are purely a matter of convenience, however, since each type possesses certain properties or characteristics in common with one or more of the others.

I: DRAFTING SCALES

A *ruler* is an instrument used as a guide for the ruling of lines.

A *rule* is an instrument graduated in actual units of measurement.

A *scale* is an instrument graduated in *representative*, or proportionate, units of measurement.

A foot on a *rule* is an *actual* foot. A foot on a *scale* is a reduced, or sometimes enlarged, *representation* of an actual foot. If you were to photograph a foot rule with the camera placed so as to bring the axis of the latter perpendicular to the plane of the rule, then the *pictured* rule would be a *scale*. It would represent one foot. And if this representation were, say, one and a half inches long, it would thereby become a scale of 1½″=1′-0″, and would properly be so designated. Hence, by knowing the actual or proposed linear dimensions of an object, you could make a geometric drawing of same by utilizing this reduced foot rule, with its proportionately-reduced inches and inch-subdivisions, as a representative unit of actual measurement. Your resultant drawing would then become a *scale working drawing*, and the length of each line thereon would be a certain definite and invariable fractional part of the corresponding linear dimension of the object. No architectural draftsman, however, who cherishes the ambition to become a *designer*, should ever allow himself to think of a scale value as that certain fractional part of the actual dimension which it represents, for the acquirement of such a habit of thought will most certainly blockade any desired development of a sense of proportion and render impossible a fundamental conception of "scale" in that sense. *Think in scale*. To a scale-conscious draftsman working at, say, a scale of one-quarter inch to the foot, a quarter inch IS a foot—*not* 1/48th of the linear dimension which it represents. Moreover, his 20-inch by 30-inch drafting board is *80 feet wide and 120 feet long*. And his instruments, likewise, are "in scale" with his drawing.

The geometric genealogy of drafting scales is graphically portrayed in Figure 82 at Diagram "1." This is their "family tree." And the *foot rule*, here necessarily shown at reduced size, is the progenitor of them all. This Diagram brings out the fact very

clearly that a scale is not a rule but a proportionately-reduced or enlarged representation of same. Any straight line paralleling the foot rule and limited by the converging lines *ac* and *bc*, or by their prolongations, will complete a triangle similar to the triangle *abc*. Hence, by virtue of the linear proportionality of similar triangles, the aforementioned line will become divided in the same manner as the foot rule by any one or all of the lines converging to the common vertex *c*. So, since the converging lines here emanate from, or pass through, the graduation marks of the ancestral foot rule, any proportionately subdivided scale unit whatsoever can be materialized from this Diagram, assuming, of course, that the foot rule is actually a foot long. A scale unit of 3″=1′-0″ will now be illustratively invoked: From the 3-inch mark on the foot rule, that is, from the point *d* on *ab*, project a line paralleling *ac*, and crossing *bc* at *e*. Then the line *ef*, paralleling *ab* is the scale called forth by the geometric magic of similar triangles. And, if *ag* were an *actual* inch on the foot rule, then *fh* would be a *representative* inch at a scale of 3″=1′-0″. And the distance *eh* would have a scale value of 11″, since it is representative of the eleven actual inches, *bg*, on the foot rule. If, now, the scale unit *ef* (which is actually 3″ long) be laid off from *e* to *t*, *t* to *u*, and *u* to *v*, and the mark at *e* called *zero*, then the marks to the right of zero would represent scale *feet*, and the marks to the left of zero would represent scale *inches*. Hence, the distance *vh*, say, would have a scale value of 3 *feet* plus 11 *inches*, or, reading it directly, 3′-11″. It is thus seen that the simple and ingenious expedient of designating the mark at *e* as zero (instead of so designating the end mark at *f*), renders it wholly unnecessary to "divide" any foot unit save the initial one *ef*, as shown. The others, *et*, *tu*, etc., giving the whole number of feet contained in the "laid off" or "scaled" dimension, are left "open." This type of drafting scale is therefore termed "open divided," and is the type commonly used in the architectural drafting room. Now, as a further inculcation of the clarifying fact that a scale is not a rule but a rule's *linear relative*, imagine a yardstick placed in continuation of the foot rule, that is, with its zero end at *b*, and extending to the right in line with *ab*. Then the line *cxt*, which is the locus of all one-foot marks on the scales, will meet the yardstick at its 12″ graduation. And the line *cyu*, being the locus of all two-foot marks on the scales, will meet the yardstick at its 24″ graduation. And the line *czv*, cutting the scales a *scale* yard from zero, will cut the prolongation of *ab* an *actual* yard from *b*. If you have heretofore had any misconception as to just what a scale is, I am certain you will no longer suffer from that malady. The foregoing elucidation should utterly remove the confusion which young draftsmen repeatedly exhibit in using a scale. The discussion has mainly pertained to *reduction* scales, that is, to those of which the representative foot unit is *less* than a foot long. But the diagram also shows that *enlarging* scales, of which *kl* is one, are identical in principle and property with the others. On the enlarging scale shown in the Diagram, the scale inch *km* is further divided into scale eighths, the latter, again, emanating in accordance with the law of linear proportionality from the actual eighth-inch marks of the foot rule.

There is seldom any necessity for the draftsman to construct any of the regularly-used drafting scales, either of feet-and-inches or decimal parts. These can be purchased at a lesser price than his time would be worth in constructing them. Moreover, since the purchased scales are "machine divided," the utmost degree of precision in spacing is attained. However, it occasionally happens than an odd scale must be constructed for some special purpose. Apparently, then, the genealogical process by means of which the scales of Diagram "1," Figure 82, are chronologically placed in relation to the originating foot rule (or in relation to a line so divided), could also be utilized as a means of *constructing* a scale unit. And so it could. But it is not so intended, since, in actual execution it might prove both unwieldly and inexact. So, to *construct* a scale unit, the more practical method indicated at Diagram "2" is to be preferred. This method is an application of the identical principle underlying the genealogical chart adjacent. There are several variations of this general method of linear subdivision, but the method given is apt to be productive of the greatest accuracy since the direction of projection is made vertical, hence can be accomplished with a triangle operating on the T-square in normal position. It does, however, require another scale as a spacer. Let *np*, laid off on a horizontal, be the length of the foot unit of the required scale, and let it be required to divide this unit into scale inches and scale quarter-inches, that is, into 48 equal parts. Project *pq* vertical. Indent the point *n*. Now, utilizing, say, a chain-divided decimal scale as a spacing device, so maneuver it as to cause one limiting graduation-mark of any 48 equal and consecutive divisions to register precisely with the indented point *n*, and to cause the other limiting graduation-mark of these 48 divisions to register precisely with the line *pq*. Then, by indentation with the point of the dividers placed snug against the edge of the raking scale, mark off the required number of equal spaces, meanwhile holding the scale unmovable. Identify the indented points, if necessary, with a penciled tick-mark. Then remove the scale and project the indentations vertically to the line *np*, thus dividing the latter into 48 equal parts of which each group of four then represents one inch at a scale of *np*=1′-0″. Observe that the above construction requires no construction *lines* except the line *pq*. The scale line *nq* and some of the vertical projection lines are shown merely to clarify the method of projection. Observe, also, that the edge of the scale used as a direct spacer must be a *straight* edge, since if the points along *nq* are not collinear, the division of *np* will be inexact.

The most desirable qualification that a scale can possess, aside from the requisite one of precise graduation, is that its cross-sectional shape be such as to allow of its graduations just meeting, or ending contiguous with, the paper, yet to render said contiguity apparent without tipping the scale or viewing it in a direction other than perpendicular to the paper. Of the vari-

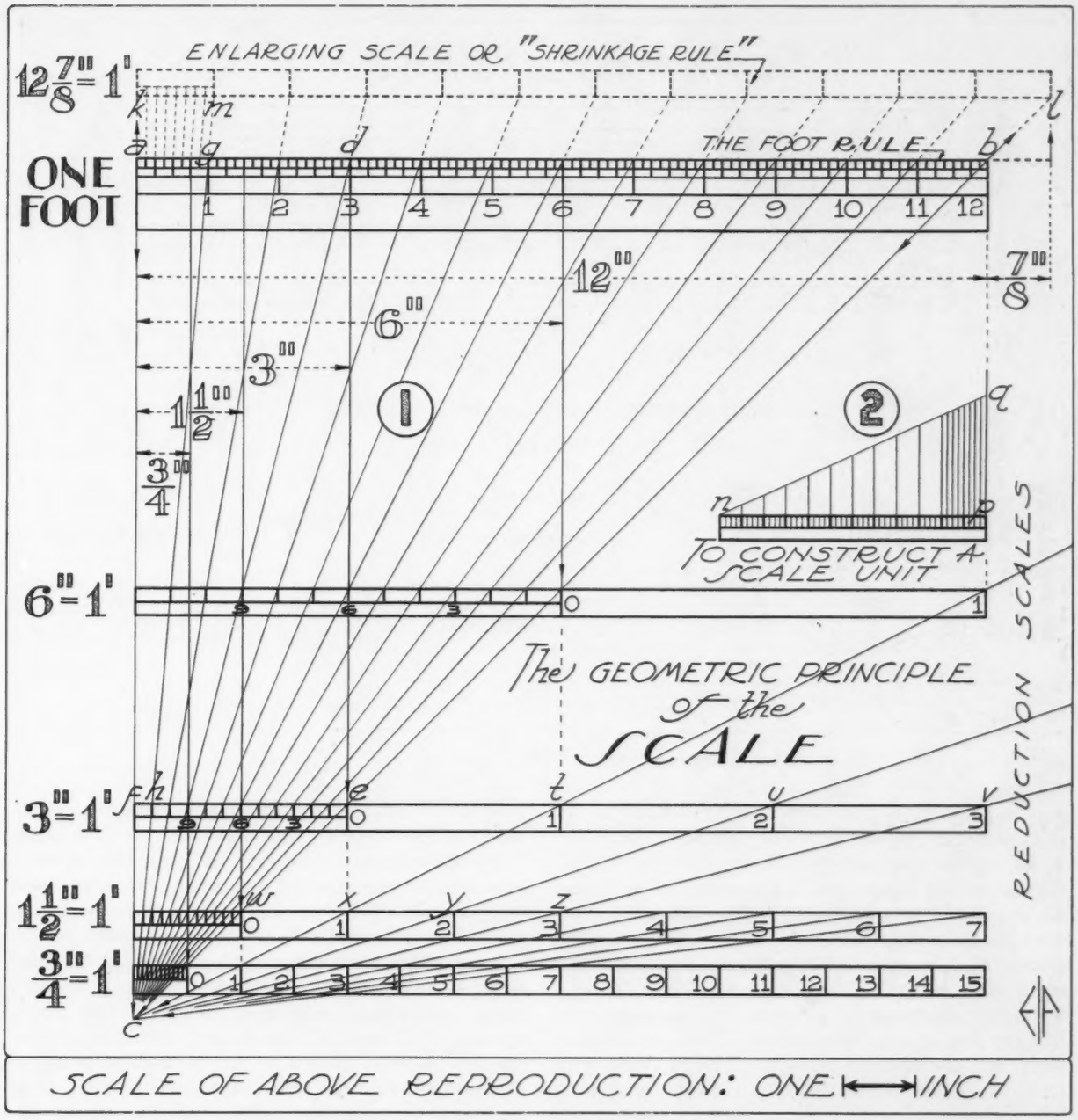

ENLARGING SCALE OR "SHRINKAGE RULE"
THE FOOT RULE
ONE FOOT
TO CONSTRUCT A SCALE UNIT
The GEOMETRIC PRINCIPLE of the SCALE
REDUCTION SCALES
SCALE OF ABOVE REPRODUCTION: ONE INCH

FIGURE 82

ous available manufactured scales, the ones having the triangular cross-sectional shape shown at Diagram "A," Figure 83, are the *only* ones possessing this desirable qualification. This shape (which is a decided improvement over the other triangular shape at "C") has its graduations carried full to its "feather edges" and, since it bears on these edges rather than on its undermost surfaces, and since the exposure-angle, *a*, is sufficient for legibility, it therefore meets the above-named qualification. Strangely enough, however, this shape was apparently designed to accomplish another wholly different purpose: namely, to prevent the eventual wearing away of the graduations on the bearing surfaces most frequently in frictional contact with the paper. But it does not accomplish this purpose. For, in this "improved" shape, shown at "A," the entire wear is concentrated on the *edges*, whereas, in the other shape, shown at "C," the same amount of wear would be distributed over its *surfaces*. Nevertheless, regardless of this question of "wear," the shape shown at Diagram "A" is, for the reason first stated, preferable to the other. To the student, "wearing quality" is irrelevant. To the professional draftsman it may possibly be worth considering. In the latter case, one or more of the "flat" scales, of which Diagram "D" is the preferable cross section, should be added to take care of the usual run of drafting-room work which, ordinarily, calls for the repeated use of one or another of the following three scales: $\frac{1}{8}''=1'\text{-}0''$, $\frac{1}{4}''=1'\text{-}0''$, and $\frac{3}{4}''=1'\text{-}0''$. These three separate scales will take the everyday "wear and tear" off the triangular scale which is then held in

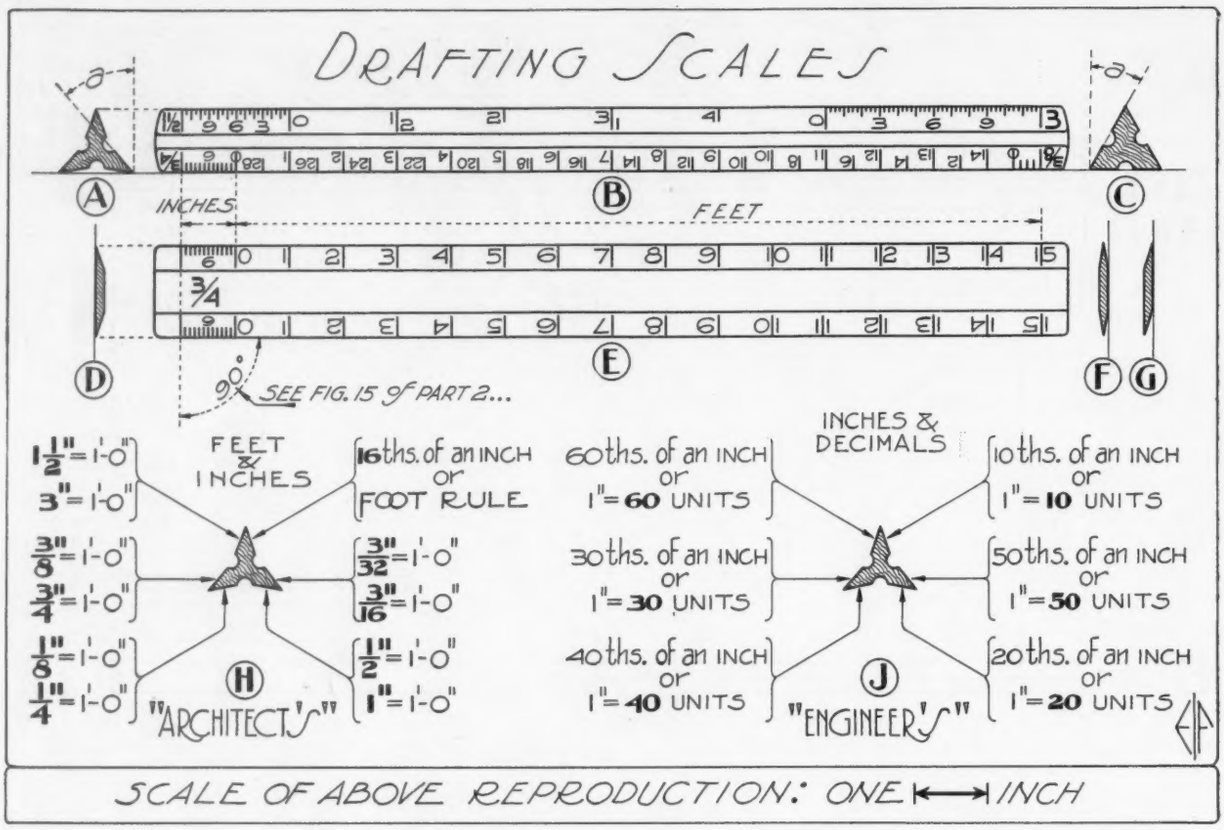

DRAFTING SCALES
INCHES
FEET
SEE FIG. 15 OF PART 2...
FEET & INCHES
16ths. of an INCH or FOOT RULE
60ths. of an INCH or 1"=60 UNITS
INCHES & DECIMALS
10ths. of an INCH or 1"=10 UNITS
30ths. of an INCH or 1"=30 UNITS
50ths. of an INCH or 1"=50 UNITS
40ths. of an INCH or 1"=40 UNITS
20ths. of an INCH or 1"=20 UNITS
"ARCHITECT'S"
"ENGINEER'S"
SCALE OF ABOVE REPRODUCTION: ONE INCH

FIGURE 83

reserve for work requiring geometric exactitude or for work at a scale not ordinarily or frequently used.

An elevation of one face of the "architect's" triangular scale is reproduced at Diagram "B" of Figure 83, at reduced size, necessarily. This manifold instrument, as fully designated on the cross section at Diagram "H," comprises ten differing feet-and-inches scales and a foot rule. The *scales* are "open divided," as further illustrated by Diagram "1" of Figure 84. But the foot *rule* is "chain-divided," that is, continuously, into sixteenths of an inch. The foot rule, aside from its obvious use, is therefore valuable as a *spacer* when working to some particular scale. Also, for this latter use, the otherwise uncommonly used scales of 3/32", 3/16", and ⅜" to the foot, are exceptionally desirable: so much so, in fact, that this useful property alone is sufficient reason for the possession of this triangular scale.

The "flat" two-way-reading individual scale, pictured at Diagram "E" of Figure 83, is the most expeditious and convenient scale of them all. It is cross-sectioned at Diagram "D," which section, from the standpoint of the *accuracy* with which a dimension may be transferred from this scale to the paper, is next in order of preference to the heretofore discussed triangular section diagramed at "A." The individual two-edge scale, being *identically* graduated on both edges can, if it meets the 90-degree test referred to in the Figure, be used directly to lay off or read *any* measurement perpendicular to a given line at the given scale. This property, under the same condition that the scale shall meet the test indicated, is possessed *in a measure* by all unrockable two-edge scales, but only *fully* by those carrying the *same scale on both edges* in the way shown at Diagram "E." In the two-edge scales of the cross-sectional shapes indicated at "F" and "G," however, this advantageous property does not exist, since it is manifestly impossible to bring the two edges of either into contact with the paper at the same time: in other words, these scales are the "rockable" kind. All things considered, then, the two shapes shown at "A" and "D" are the preferable ones. True enough, the shape shown at "D" is "hard to pick up." But this oft-repeated criticism is impertinent. *Why pick it up?* There's nothing on the other side. *Slide it!*

In addition to the feet-and-inches scales, by means of which architectural scale working drawings are invariably laid out, the draftsman should also possess an "engineer's" triangular scale carrying the decimal scales designated on the cross section at Diagram "J" of Figure 83. In reality, this instrument is not a scale, but a rule that can be used as a scale, since its invariable unit of *one inch* is also a unit of actual measurement, and since it is "chain-divided" into the decimal parts noted. Diagram "4" of Figure 84 gives a reduced facsimile of but one of the six faces of this triangular scale. The various typical uses lettered *A* to *J*, inclusive, indicated thereon, should be sufficiently suggestive to require no further recommendation as to the desirability of this decimal scale to an architectural draftsman, regardless of the fact that decimal scales are never used for working drawings. Take particular note, however, that the decimal scales

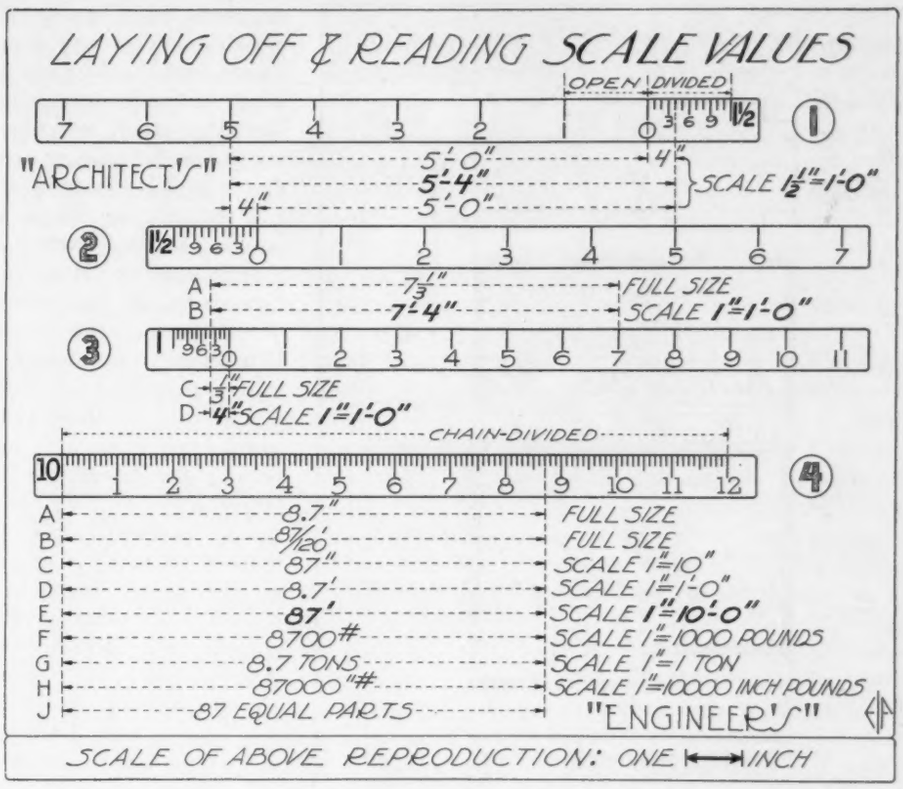


FIGURE 84

are read from the *end* thereof, in exactly the same manner in which a rule is read. This is made clear in this Figure which indicates both the manner of reading the architectural scales of feet-and-inches at Diagrams "1," "2," and "3," and the decimal scale, or rule, at Diagram "4." Note, also, the single instance in which an *architectural* scale is also a rule: namely, the scale of 1″=1′-0″, shown at Diagram "3." In this one and only instance the unit graduation marks of the scale are also actual inch marks. And the initial unit of this scale is divided into 48 equal parts, each part *representing* a quarter inch at this scale but being actually *48ths of a real inch*. Hence, this scale can be used directly to lay off or read a measurement to 48ths, 24ths, 12ths, 6ths, or 3rds of an inch as at *A* and *C* of Diagram "3"—which same can *not* be done by the regular foot rule. Thirds of an inch can also be gotten on the decimal scale; namely, 10/30ths. Simple too, but seldom thought of. A third of an inch is 16″ at a scale of ¼″=1′-0″. So there you are: the common spacing of studding, etc. Mark 'em off on the chain-divided decimal scale of 30ths: 10, 20, 30, 40—as far and as fast as you like! This is only an *inkling* of what you are going to learn about the practical *use* of drafting scales in Parts 10 and 11 of this geometry. Meanwhile, there's more to learn about scales in general.

No scale for practical drafting should be less than a foot long. The "vest pocket" variety are a nuisance for this use. For some work, scales two feet long will become desirable. A scale of ⅛″ to the foot, 12″ long, will scale 12 times 8 feet or 96 feet, which is 4 feet short of a hundred. But scales can be procured 12½″ long which, at a scale of ⅛″ to the foot, will encompass a full hundred feet without a shift, and at a scale of ¼″ to the foot will lay out or measure a full fifty feet without a shift. This, again, is sometimes an advantage, inasmuch as property divisions commonly occur in fifty-foot units. Moreover, in laying off a long distance, necessarily requiring consecutive placements of the scale, it is easier, and *safer*, to reckon in 50-foot or 100-foot intervals than in 48-foot or 96-foot jumps.

Three conditions operate to determine the particular scale at which a drawing shall be made: (1) The size of the drafting-board, or the predetermined or standardized size of the sheets that make up the eventual "set of working drawings." The determination of sheet size is influenced by the economy of conforming to the available widths of paper, cloth and blueprints, as well as by a consideration of the *practicability of handling the sheets on the job without the necessity either of rolling them or of folding them.* (2) The accuracy with which the drawing is to be laid out, or the completeness of its figured dimensioning or subsequent "detailing" and "full sizing." (3) The accuracy with which the drawing can be "scaled" with the builder's *rule*, or the degree of approximation allowed him in so scaling an unfigured distance.

The first two conditions require little comment. Under condition (1), if the size of the board is the limiting factor, merely *measure the board at the proposed scale of the drawing* and you will readily discover if the board will contain it. Under condition (2) the graduation-intervals of the scale unit will measure the minimum distance that can be *accurately* laid off. At a scale of ⅛″=1′-0″, a scale inch must be *estimated*, since the unit subdivisions of this scale are usually *two* inches apart. On the other hand, at a scale of 3″=1′-0″, an *eighth* of an inch can be accurately represented, but a *sixteenth* must be determined by interpolation. Condition (3) deserves more than *passing* comment: it *should* be, and herein *will* be, *dwelt upon*. Draftsmen who "never get away from the board" persistently overlook the significant fact that, while drafting scales are invariably used to *lay out* working drawings, they are, outside the drafting-room, seldom used to *read* them. Hand each of ten builders a drafting scale, and ask each to therewith

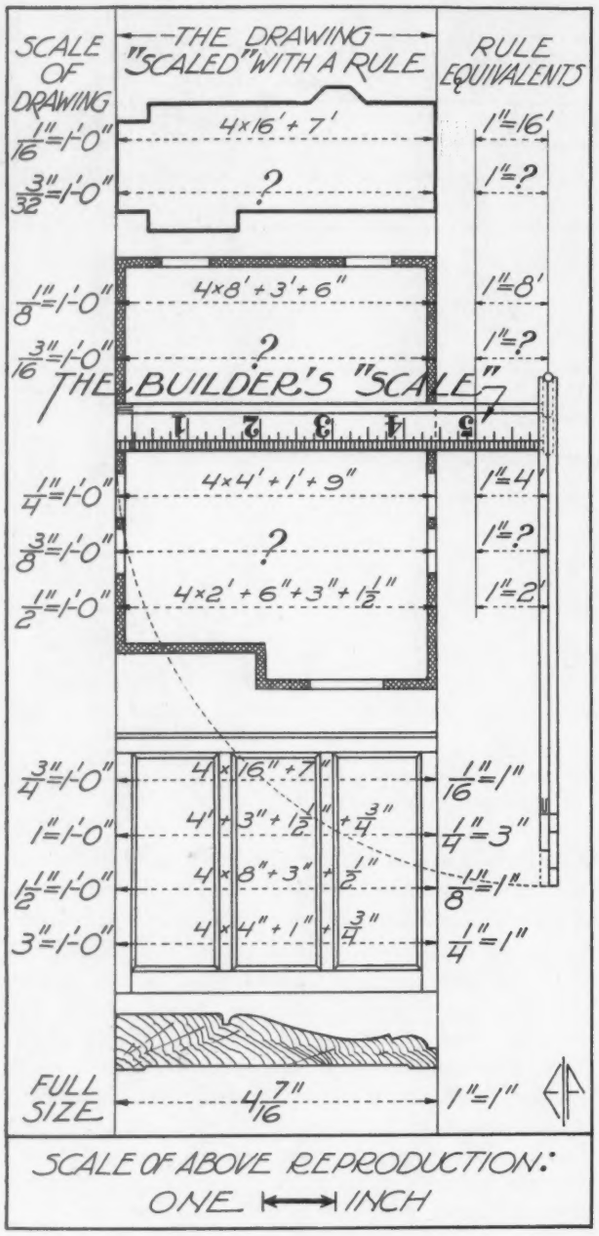


FIGURE 85

"scale" a drawn line. Nine of them will immediately recoil from the profferred mathematical-looking instrument and—*reach for their two-foot rules.* The tenth may possibly accept the challenge, fumble the scale for awhile, finally get the proper foot-mark at *one* end of the line, doubtfully count the inch-marks between zero and the *other* end of the line, shove your scale aside, reach for *his* rule, *and thereby check the dimension* before staking his reputation upon a "fool scale." Joke? All right, then here's another one: Lay aside your T-square, your triangles and your finely-graduated scales, and make a working drawing with a *steel square.* Now whose turn is it to laugh? It's just as unreasonable to expect a builder to make use of a drafting scale to *read* a drawing as it is to expect a draftsman to make use of a builder's steel square to *make* a drawing. In fact the former expectation is the more unreasonable of the two—for a "working drawing," by its very designation, connotes *a drawing from which a builder can work,* that is, a drawing from which he can procure, with the means at his command, the information necessary to materialize the thing which the drawing represents. The only instrument that is held in common by a draftsman and a builder, and the only instrument with which both are equally familiar, is a *rule*—which is neither a drafting scale nor a steel square. Hence, lacking explicitly-designated dimensions, the *rule* becomes the only equitable means of interpreting the "scale" of a working drawing. Wherefore: (a) A scale working drawing should be fully dimensioned, or (b) it should be drawn at such a scale that the unfigured dimensions will correspond to an exact graduation interval on the builder's rule, or (c) the inexplicit portions should be detailed at larger scale, or (d) an approximation in "scaling" should be allowed equal to the builder's ability to estimate the distance that any portion of a sixteenth of an inch would represent at the scale noted on the drawing. In other words, if the proposed scale of the contemplated drawing were, say, $\frac{1}{8}''=1'\text{-}0''$, a dimension of 17′-9″ should be, (a) given in figures, or (b) the drawing made at a scale of $\frac{1}{4}''=1'\text{-}0''$, or (c) a larger scale detail or full size section referred to, or (d) the builder allowed to "estimate" this distance *anywhere* between 17′-6″ and 18′-0″.

Of course, there are "vest pocket scales" and there are "scale rules." But a census of the building mechanics who understand and use such instruments would not equal the population of an agricultural town on the Mohave desert. A *rule,* graduated no finer than sixteenths of an inch, *is the builder's scale.* And by means of this rule he interprets the draftsman's scale somewhat in accordance with the mental processes indicated by the arithmetical and other symbols of the psychological document herein designated as Figure 85. Note that, so far as being interpretable with a builder's rule, the scales of 3/32″, 3/16″, and $\frac{3}{8}''$ to the foot are utterly hopeless. These scale units are not aliquot parts of an inch: no divisions on the workman's rule, and no mental gymnastics of which he is capable, would tell him, for instance, how many 3/32nds, 3/16ths, or $\frac{3}{8}$ths of an inch were contained in that distance of 4 7/16″ which his rule here measures. If, for that reason, you brand the workman as lacking in mentality, try to solve this riddle yourself—not with *your scale,* but with *his rule.* Observe, again, that in the scales of $\frac{1}{2}''$ and 1″ to the foot, the least number of *whole* inches that can be read is three. Put the scale unit of each of these scales alongside an inch on the rule and you'll see why: the only inch-marks of these two scales that coincide with the sixteenth-inch-marks of the rule are the third, sixth, and ninth. Hence, no *whole* inches, except 3, 6, and 9, can be read off the rule: they must be "estimated" instead. As a matter of fact, then, these scales can not be read by a builder any more closely than the scale of $\frac{1}{4}''=1'\text{-}0''$, for the non-corresponding whole-inches interval is the same in all three cases. True enough, as Figure 85 indicates, the scales of $\frac{1}{2}''$ and 1″ to

the foot *can* be read to the particular *fractional* inches shown, *provided the drawing is laid out in the same manner*, as it merely happens to occur in this example if taken at these scales. In practice, however, this is seldom the case, and, even though it were *often* the case, it is doubtful if a workman would ever become thoroughly conscious of the fact that a sixteenth of an inch on his rule represents exactly one and a *half* inches at a scale of ½″=1′-0″, and three *quarters* of an inch at a scale of 1″=1′-0″. The diagram here referred to, however, gives him the benefit of the *doubt!*

To sum up: The scales of 3/32″, 3/16″, ⅜″, ½″, and 1″ to the foot are unsuitable for drawings proposed to be *worked from*, even though said drawings be fully dimensioned. Never lose sight of the fact that a contractor, in taking quantities off a plan, or in estimating the cost of a building therefrom, *seldom reads figured dimensions*—there'll be time enough for *that* when he *gets* the job. So he notes the scale, then "slaps his rule on the plans" and therewith speedily "scales" them in his own peculiar way. Another thing: In this day of high-speed production, when an architect's client keeps the telephone busy with inquiries as to when those plans will be finished or with threats about deducting loss of rental from the architect's fee, seldom are any but the *controlling* dimensions of a project marked on the drawings. The designated scale is left to take care of the ungiven dimensions. And the contractor does the *scaling*—not the draftsman. All of the foregoing significant, but often disregarded, facts, should have a direct and influential bearing upon the manner in which *building* plans are prepared for a *builder* to *build from*. They must be translatable in *his* language if they are to become "instruments of service." Finally, bear in mind that while comparatively large-scale drawings require more paper and run up the blueprint bill as well, yet they are actually *made* in less time than the same drawings at a finer scale—thereby not only making up for the higher cost of material by faster production and prolonged eyesight, but also becoming actual *working* instruments instead of suggestions.

Now let the decorative panel shown in Figure 86 represent a scale detail of some intricate tile paving or other pattern work which is, usually, adjudged by a contractor to cost "so much per *square* foot." Suppose further that there were no units recognizable in this design that would unmistakably serve to establish the scale at which the drawing was made, which scale, in this instance, was not marked thereon and that, unfortunately, the drawing occurred in the immediate vicinity of another detail of which the designated scale was twice that of the detail under consideration. The contractor, logically assuming the scale of the panel as twice its actual scale, got an area of 12 square feet, upon which he based his cost—*and got the job!* Naturally; for the actual dimensions of that panel were *twice* what he assumed, hence, the area *four times* as great as he had calculated! Wherefore an argument eventually became precipitated—and the *architect* paid the difference. But the latter individual never again let a drawing or a detail leave the drafting-room *minus a scale designation.* The proportionality of drafting scales, one to another, is *linear*, not *quadratic.* That's the lesson of Figure 86.

If you make a drawing at, say, a scale of one-quarter inch to the foot, for magazine reproduction, and designate the scale of same by an *equation* (as you ordinarily would on a working drawing) like this—Scale, ¼″=1′-0″—and the drawing is then reproduced at, say, one-fourth of its original dimensions, that carefully-lettered scale equation would no longer be true, for the scale of the reduced reproduction would be 1/16″=1′-0″: said scale "coming down" along with the drawing, and in identical ratio. But if, on the original drawing, you had drawn a line, say 1″ long, and visibly divided it into four scale units, and marked this line "Four Feet"—which it certainly would have been at the scale of your drawing—then this line, and its marked length, would have remained "Four Feet" in the reduced reproduction, although it also would have "come down" to one-fourth of its original length, that is to ¼″, which IS four feet at a scale of 1/16″=1′-0″. Hence, the graphically-presented scale would have remained true of the reproduction, as it would have been true of the original. Moreover, it would have remained true regardless of any change whatsoever in size—whether by reduction or enlargement, shrinkage or expansion. Wherefore, "graphic" scales (so-called only in distinction to a *scale equation*) of any design that may please the draftsman's fancy should be prominently placed on all drawings that are to be reproduced by any process that would appreciably alter linear dimensions. In exceedingly rare cases, *blueprinting* may come under this classification, but ordinarily, blueprinted, or contact-printed, working drawings in which the over-all and controlling dimensions are *given in figures*, need cause

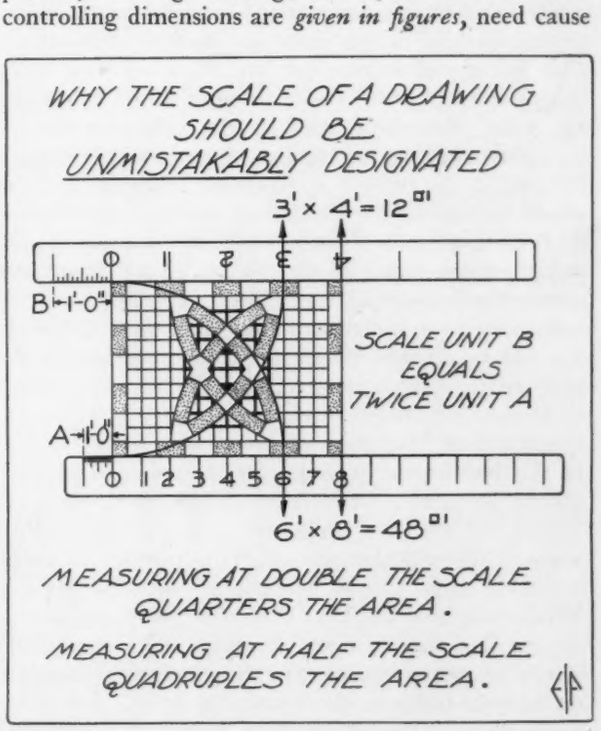

WHY THE SCALE OF A DRAWING SHOULD BE UNMISTAKABLY DESIGNATED
3' × 4' = 12 □'
0 1 2 3 4
B 1'-0"
SCALE UNIT B EQUALS TWICE UNIT A
A 1'-0"
0 1 2 3 4 5 6 7 8
6' × 8' = 48 □'
MEASURING AT DOUBLE THE SCALE QUARTERS THE AREA.
MEASURING AT HALF THE SCALE QUADRUPLES THE AREA.

FIGURE 86

no concern in this respect, since the shrinkage of a print in drying does not alter a *figured dimension*, nor does it affect the distances that must be "scaled" therefrom to such an extent that a builder could discern the difference on his rule—a difference, more or less, of a *hundredth of an inch* to the foot. Moreover, if you were to put *drawn* scales on a set of working drawings in lieu of the customary equations, the bewildered contractor would *wonder* where in *thunder* he had to put all those carefully-dimensioned *ladders!* —and why in the selfsame-sequence-of-lightning you hadn't marked a *scale* or two on the plans!

Architectural draftsmen are sometimes required to make shop drawings of patterns, moulds, or castings. Cast material contracts in cooling. The most emphatic and pertinent instance of this is, of course, architectural terra cotta. A piece of unfired terra cotta—which is *clay*—measuring 12⅞″ square, will be reduced to 12″ square after firing. This unqualified statement is merely by way of example: it may not always hold true, since the degree of shrinkage in cooling depends upon the thickness of the piece, the kind of clay used at any particular plant, and the conditions under which it is cast and burned. Assume, however, that it is correct. Then, in order to make a "full-size" shop drawing of this panel you'd have to detail it at a scale of 12⅞″=1′-0″, which is *greater* than full size. The only difference between this drafting scale and the ones heretofore fully discussed is that this one is an "enlarging" scale: it also being designated as such in Figure 82 here first given. However, *enlarged* scale drawings, of the kind now under consideration, are *read with the same scale that was used in making them.* In the hands of a pattern-maker, a drafting scale of 12⅞″=1′-0″ becomes a chain-divided "shrinkage rule"—the latter designation being a trade term applied by him to this particular kind of *scale*, that's all. For the draftsman's reference, a complete table is here given of the various enlarging scales, or shrinkage rules, commonly used by the pattern-maker in laying out patterns for castings of the materials named. Of course, for simple straight-line patterns, such as would be required for castings of structural details etc., no "enlarged" scale drawings are usually required: the pattern-maker can, in these cases, work from *any* dimensioned drawing or full-size detail by merely noting the given dimensions and, using the corresponding values on his "shrinkage rule," laying out the thus-enlarged patterns directly. In work of an architectural or ornamental nature, however, in which the character, or "feeling," of the design would be lost by this translation, *drawings* for the enlarged patterns should be made. The scale values here given in TABLE 1 are those ordinarily used in practice. Previous to adopting any one of them, however, a verification of same should be obtained by local inquiry. Where much of this kind of drafting is contemplated, the regular manufactured shrinkage rules (so-called) should be procured, either of the standard graduations or made-to-order as the demand may be. For occasional work, a needed scale can readily be constructed that will serve as well as any. (See Figure 82)

TABLE 1

Enlarging Scales or "Shrinkage Rules" for Detailing Patterns for Castings

Material of Casting	Scale of Pattern
ALUMINUM	12 3/16″=1′-0″
Bismuth	12 5/32″=1′-0″
BRASS	12 3/16″=1′-0″
Britannia	12 1/32″=1′-0″
Copper	12 3/16″=1′-0″
IRON	12 ⅛″ =1′-0″
LEAD	12 5/16″=1′-0″
Steel	12 ¼″ =1′-0″
TERRA COTTA	12 ⅞″ =1′-0″ 13″ =1′-0″
Tin	12 ½″ =1′-0″
Zinc	12 5/16″=1′-0″

II: DIAGONAL SCALES

A diagonal scale is a scale of fractional parts. It can not be used directly, in the manner of a drafting scale, since it is not *edge* graduated. In other words, a required dimension must be transferred from the diagonal scale to the paper by other means than the scale itself. However, in spite of this outstanding disadvantage, it will, on the other hand, yield values which no other scale or rule contains. Hence, though the diagonal scale is of limited use, it becomes the only expedient and practical means, at times, of determining a required value. Its construction and use should therefore be thoroughly understood — though no terrific mental effort is required to achieve this understanding.

Two simple cases will be illustrated, which will dictate the procedure for any others that may arise. Let it be required to construct a diagonal scale that will read to, say, any number of 64ths of a given distance, and let this given distance be the line *AJ* of Diagram "1," Figure 87. The *denominator* of the scale is, then, the number 64. And any value read off the scale will then be the *numerator* of the fractional part yielded. Now, *as in all cases*, determine the two largest or most convenient whole numbers which, multiplied together, will just equal the *denominator* of the proposed scale. In this case, since the number 64 is a perfect square, the two largest integral factors of *this* denominator are 8 and 8. So far as the construction of the scale is concerned, however, the two factors might just as well have been 4 and 16, or 2 and 32, or 1 and 64. The choice is a matter of convenience and practicability, as you will discover. In this case, 8 and 8 are, at once, the largest and most convenient factors that can be used. Next, divide the base line of the proposed scale, which is the given line *AJ*, into a number of equal parts corresponding to *either* of the two chosen factors. Since, in this example, both chosen factors are 8, there is here no

choice in the matter: *AJ* must be divided into 8 equal parts. If the distance *AJ* is such that this can not be done directly with a rule or a drafting scale, then utilize the method heretofore shown at Diagram "2" of Figure 82. In *any* case the division must be exact, for you are now manufacturing an *instrument of precision*. Hence, instead of marking the points *A, B, C, D,* etc., by *lines* crossing *AJ*, mark them by *indentation only*, and precisely on the given line. Then, through the indented point *A*, project a line *AO* of any length and in any direction, but preferably perpendicular to *AJ* as shown. Now, with the bow spacers, or directly from a drafting scale, space off on *AO*, commencing at *A*, a number of equal parts corresponding to the *other* factor of the scale denominator—in this case 8. But *these* parts can be of any convenient magnitude whatsoever—they are obtained by *spacing*, not by *dividing*. So far, so good: the number of parts in *AJ*, multiplied by the number of parts in *AO*, equals the *denominator* of the scale—64, in this case. But the condition stated is a *typical* requirement—and easy to remember. Now then, commencing at the *upper* point on *AO*, which is the *zero* graduation of this scale, designate the vertical graduations in numerical sequence as shown: *0, 1, 2,* etc., etc., ending at one extremity, *A*, of the given line. Through these graduation marks draw the lines paralleling *AJ*, which lines are here horizontals—and always preferably so, since they can then be projected with the T-square in normal position. Then, utilizing the precise technique and manipulation heretofore made plain in Diagram "A" of Figure 53, Part 6, project the extraneous line *BO*, and project the remaining diagonals parallel therewith through the given points *C, D, E,* etc., as Figure 87 directs. Finally, mark the first diagonal from zero, on the top line *OM*, with the *same* number that occurs at point *A*, which number, in *this* case, is 8. Using this number, *whatever it may be*, as the graduation interval of *OM*, number the successive diagonals as shown. This should result in the number of the last diagonal (here *56*) being one interval short of the number which is the *denominator* of the scale. This last interval, however, is not a requisite but is here indicated for clarity. The diagonal scale is complete. Now to *read* it:—

Every intersection of a horizontal with a diagonal is some definite number of 64ths of *AJ* from the vertical *AO*. And this number is the *sum* of the index numbers of that particular horizontal and diagonal. Consider the point *R*. Its index numbers are *7* and *24* which, added together, make 31. Hence, 31 is the *numerator* of the fractional part *7R* whose denominator is the denominator of the scale—64. The distance *7R*, then, is 31/64ths of *AJ*. That's all there is to it. The system of numbering makes the reading simple. Suppose *AJ* were an inch. Pick off 37/64". Find the nearest lesser index number to 37 on the top line—by looking along the line from zero to the right. It's *32*. And *32* from 37 leaves *5*. Follow down the 32-indexed diagonal to its intersection with the horizontal bearing *5* as its index. Then *5P* equals 37/64". By the same token, *3N* equals 3/64", since *3* plus *0* is 3. Now, suppose *AJ* were still one inch, and divided into 16 parts instead of 8, and that the scale were reconstructed accordingly. Then you'd have a scale that would read to 128ths of an inch, since its denominator would be 16 times 8, which is 128. Or if instead of marking off 8 spaces on *AO*, you mark off 16, still making *AJ* one inch and also divided into sixteenths, then you'd have a scale with a denominator of 16 times 16 or 256—and you could pick off therefrom a line to 256ths of an inch. You certainly could not do *that* by any other means—a quarter of 1/64" is 1/256"—no edge-graduated instrument could contain 256 marks to the inch and be readable.

Referring again to Diagram "1" of Figure 87: connect the lettered points on the base line with the numbered points on the top line, as the dotted lines of the Diagram indicate. These lines will, naturally, be parallel with *AO*. By this arrangement, the number *64* now indicates that 64 is the denominator of the fractional parts of *AJ*, and the number *56* indicates that 56 is the denominator of the fractional parts of *AH*—etc., etc.—the number *8* indicating that 8 is the denominator of the fractional parts of *AB*. So now, *3N* is 3/8ths of *AB*, 3/16ths of *AC*, 3/24ths of *AD*, etc., etc., and 3/56ths of *AH* and 3/64ths of *AJ*. Similarly, *5P* is 37/40ths of *AF*, etc., etc., as well as 37/64ths of *AJ*. And *7R* is bound to be

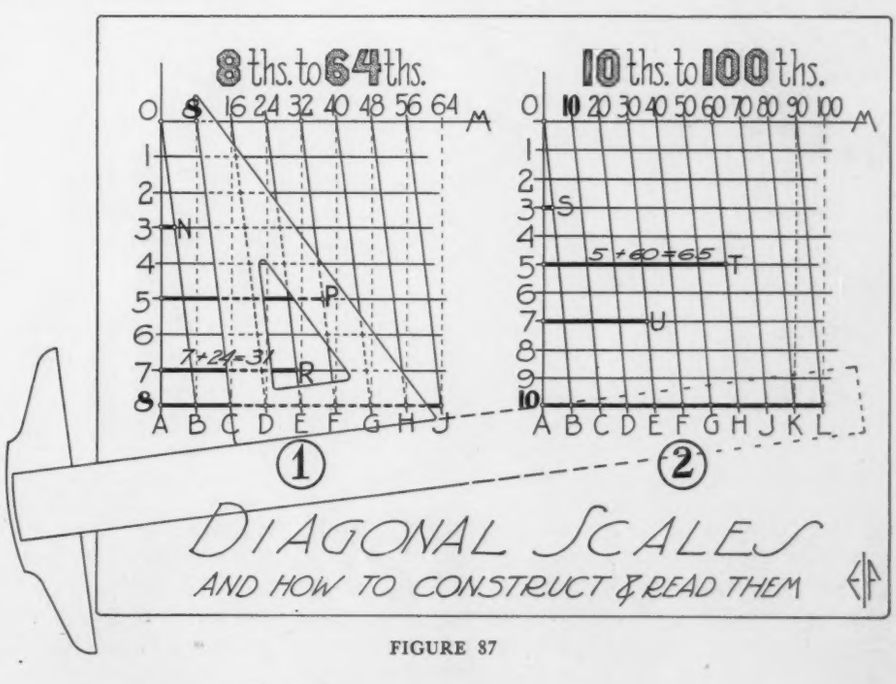


FIGURE 87

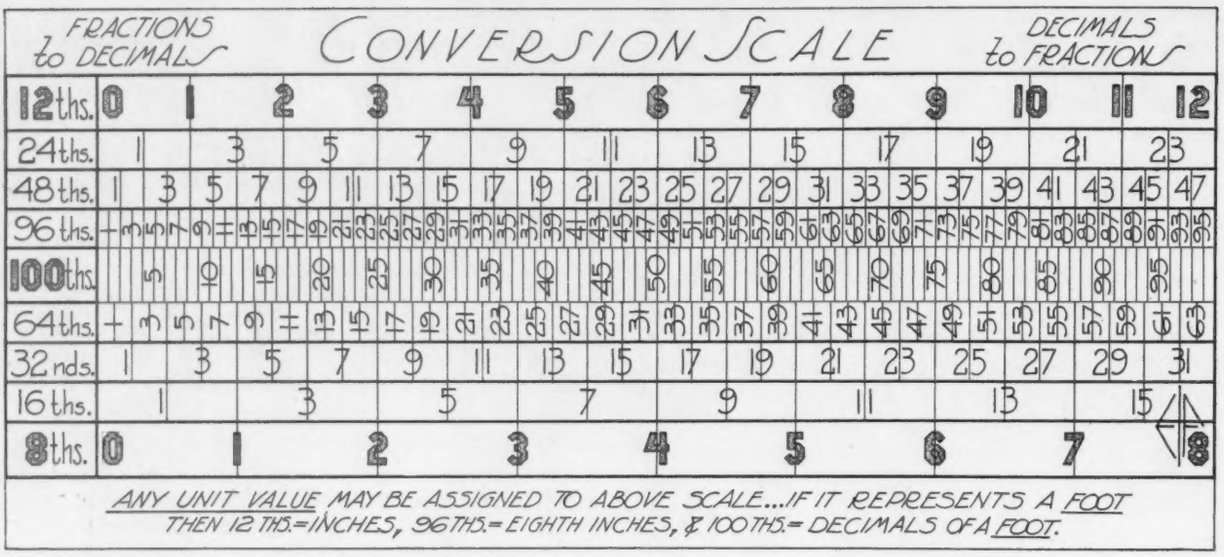


FIGURE 88

31/32nds of *AE*, etc., etc., as well as 31/64ths of the line *AJ*. All of which is evidence that a scale of fractional parts, of any denomination whatsoever, is possible. In case the denominator is a *prime* number, however, this type of scale becomes less compact than when the denominator of the desired fractional parts is capable of being factored as shown—although, even in the *prime* case, it may possibly prove to be the only precise way of achieving the result desired.

The other scale at Diagram "2" reads to hundredths of *AL*. Wherefore, letting *AL* equal 100, the distance *3S* equals *3* plus *0*, or 3. And the value of *5T* is *5* plus *60*, or 65. And *7U* is 37. Getting down to "brass tacks," if *AL*=1", then, in the order named, the above values would be .03", .65", and .37". So there you are: lay out an inch scale of this type on a piece of Bristol board, using a razor blade to draw the lines instead of a pencil, and you have an exceedingly useful instrument from which you can pick off 100ths of an inch—*which none of your drafting scales yield*. The nearest you can come to, say, .69", on the decimal drafting scale, without interpolation, is either 34/50" or 35/50". And the nearest corresponding value on the foot rule is 11/16", which, in this particular case, happens to be more nearly exact than the *decimal* drafting scale approximation.

Again, in Diagram "2," suppose *AL* were a foot long and divided into 100 parts instead of ten, and that *AO* were 100 spaces instead of ten. Then you'd have a scale with a denominator of 100 times 100, or 10000, that would read to *ten-thousandths of a foot* without any confusion whatsoever, since the diagonal lines of this scale would still be nearly an eighth of an inch apart. The index-numbering would be accomplished in accordance with the identical system already explained in connection with the scale of 64ths. And the hundredths divisions of the foot, along *AL*, could be laid off directly from the decimal scale of 50, since 6/50" is 1/100'—hence, chain-space them off—0, 6, 12, 18, etc., etc.—to 600 at the end of the decimal scale. And, as has been said, the 100 spacings on *AO* could be *any* equal distances. In this case, however, they might just as well be the same as those on the base line *AL*, thus making the scale a foot square. Decimal scales of this diagonal type can also be used as conversion rules by applying a foot rule directly to any part of the scale and reading the decimal to the nearest sixteenth of an inch on the foot rule.

And here's another "wrinkle" with the diagonal scale: Let *AK* of Diagram "2" be the length of one-fourth the circumference of any circle, either actual measurement or to any scale. Then, since *AK* is divided into *nine* equal parts, and *AO* is *ten* equal spaces, the *denominator* of the scale is now 9 times 10, or 90. But 90 is the number of degrees in a quarter circle. Incontrovertibly, then, if *AK* were made the *length* of that 90-degree arc, then *3S* would be the *length of a 3-degree arc*, *5T* the *length of a 65-degree arc*, *7U* the *length of a 37-degree arc*, etc., etc., the scale yielding, directly, *the length of every arc of whole degrees from 1 degree to 90, inclusive.*

III: CONVERSION AND COMPARING SCALES

Draw a line of any length whatsoever. Divide it into 64 parts by marks just meeting it on *one* side. Divide it into 100 parts by marks just meeting it on the *other* side. You have constructed a *conversion* scale. In other words you have set up a convertible system of purely *relative* values, whereby you could tell, by mere inspection, how many 64ths of *anything* were contained in a certain number of 100ths of the *same thing*—or vice versa. The *anything* could be an inch, a foot, a pound, a door-knob, or a battleship—whatever designation you choose to assign to the scale. For this scale simply gives you two means of expressing the same relation of a part to the whole. For instance, if the scale represented an inch, it would show you that you could express ¼" as .25". Also, if it represented a door knob, it would show you that you could express ¼ of a door knob as .25 of a door

knob. But it wouldn't tell you the actual *magnitude* of either inches *or* door knobs.

Draw another line. But don't divide it this time. Instead, from *one* end of the line, *space off* thereon any *definite units of measurement*—say sixteenths of an inch—as far as you like. Then, from the *same* end of the line, space off any definite units of any other linear system of measurement — say millimeters — about as far as you did the others. You have constructed a *comparing* scale. In other words you have set up a comparative system of *actual* values, whereby you could tell, by mere inspection, how many sixteenths of an *inch* were contained in a certain number of *millimeters*—or vice versa. And that's all that this particular scale would tell you—although, being constructed of actual units of measurement of the compared systems, you could also use it to determine actual magnitudes that were to be measured or laid off by either system—provided the scale were extensive enough for the purpose.

Obviously, the names of the above two scales might be just the reverse, since *conversion* of one value to another equivalent value is accomplished in both by optical *comparison*. As has been noted, however, the nominations are convenient rather than distinctive.

The Conversion Scale given in Figure 88, and the Comparing Scale given in Figure 89, were prepared by the author for actual drafting-room use. They are working instruments. And the Conversion Scale, especially, will be found to be much more expeditious and complete than mathematical "tables" for accomplishing the same thing. Moreover, the *graphic* conversion of fractions to decimals, or vice versa, shows you just how close an approximation the conversion results in.

All engineering calculations are made decimally. And the results, if they determine linear dimensions, must be expressed in feet and inches on the drawings, since no building-construction workman uses a *decimal* rule. Again, surveyors use the decimal system of linear measurement which, in order to make it understandable to a *workman*, must also be converted into terms of the mechanic's foot rule. Both of these conditions render likely the everyday use of the conversion scale shown here at Figure 88. A calculation calls for a steel rod to be .81″ in diameter. But steel rods are made in diameters varying by sixteenths, not hundredths. Looking along the 100-strip of the scale, stop at 81. The nearest sixteenth to this is immediately seen to be 13. Hence the size of the rod goes on the plans as 13/16″ in diameter, not .81″. A survey comes in with a dimension marked thereon of 19.95′. How much is that .95′ in inches to the nearest eighth? Eighth inches are 96ths of a foot. The nearest 96th to the 95-mark of the 100-strip is 91, which, as the scale instantly shows, is 11 3/8″. For you have not failed to see that, when a value of one foot is assigned to this scale, the upper half can then be read in precisely the same manner as a foot rule, regardless of the fact that *all* subdivisions are here numbered consecutively from the end of the scale.

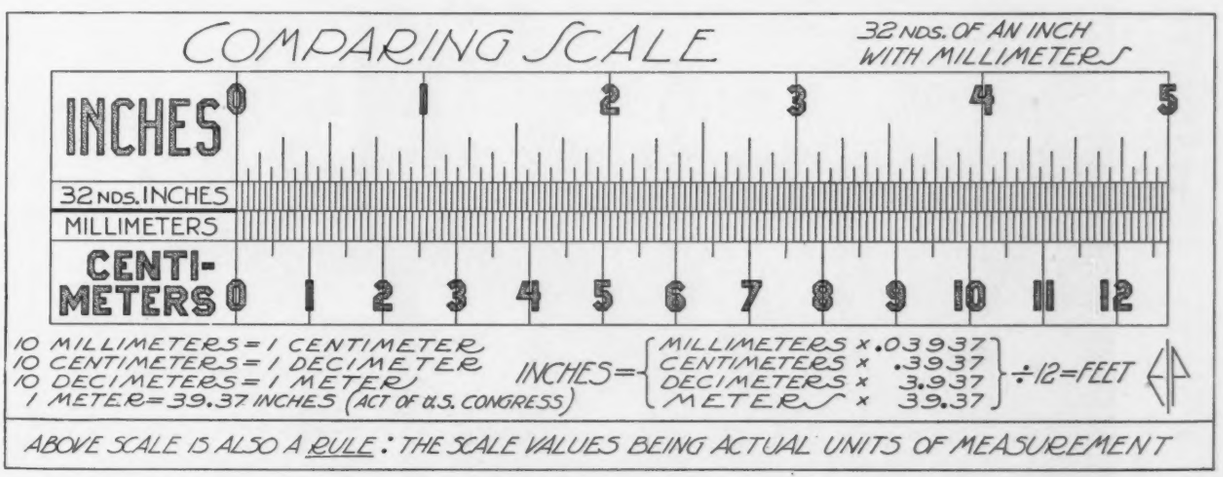
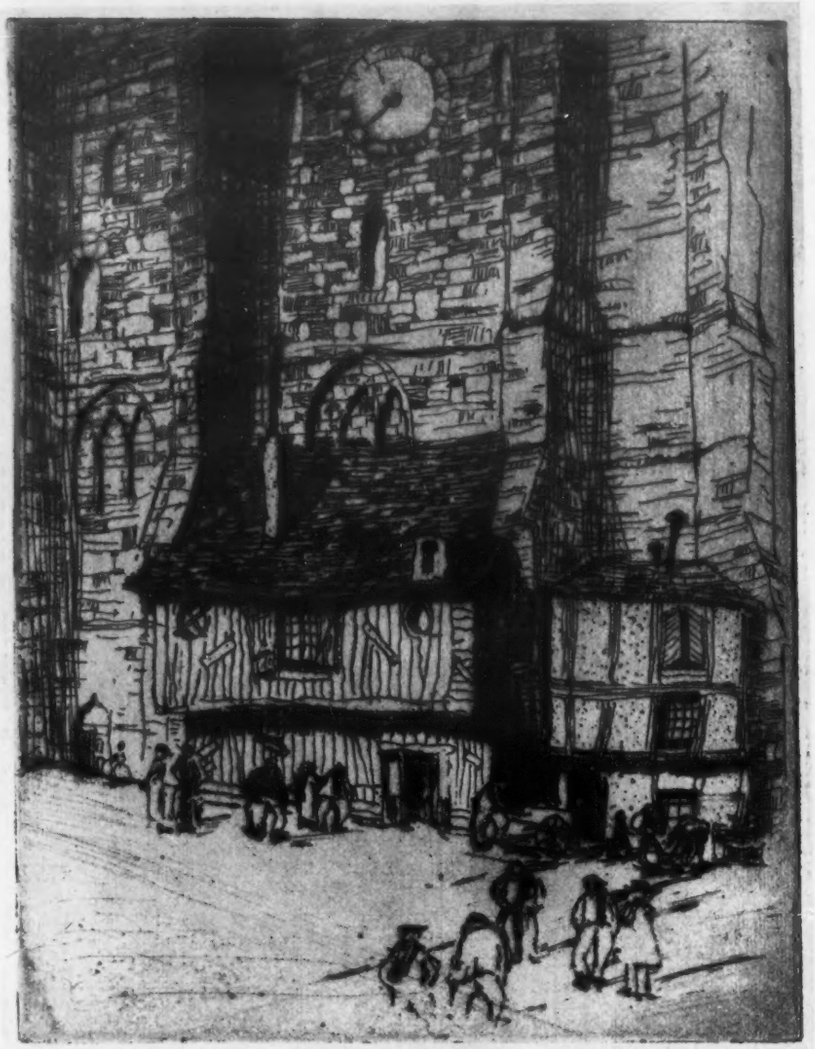

COMPARING SCALE
32 NDS. OF AN INCH WITH MILLIMETERS
INCHES
0 1 2 3 4 5
32 NDS. INCHES
MILLIMETERS
CENTI-METERS
0 1 2 3 4 5 6 7 8 9 10 11 12
10 MILLIMETERS = 1 CENTIMETER
10 CENTIMETERS = 1 DECIMETER
10 DECIMETERS = 1 METER
1 METER = 39.37 INCHES (ACT OF U.S. CONGRESS)
INCHES = MILLIMETERS × .03937
CENTIMETERS × .3937
DECIMETERS × 3.937
METERS × 39.37
÷12 = FEET
ABOVE SCALE IS ALSO A RULE: THE SCALE VALUES BEING ACTUAL UNITS OF MEASUREMENT

FIGURE 89



SAVERNE, FRANCE

NOTRE DAME, PARIS

FROM AN ETCHING AND A CRAYON SKETCH BY JOHN SCHWARTZ

GUY LOWELL SCHOLARSHIP AWARDED

THE GUY LOWELL MEMORIAL SCHOLARSHIP for 1930 has been awarded to Charles Le Boutillier, Jr., of New York. B. S. Gruzen of Jersey City and O. K. Fulmer of Cambridge, Mass., were placed second and third respectively.

The subject of the competition was *An Assembly Hall and Theatre for Music and the Drama*, which it was proposed to erect at a fashionable seaside resort which could be assumed either in the north in the summer time or in the south in the winter.

For this purpose the program stated that there would be a sufficient area, but not to exceed 120,000 square feet, on a wooded hillside sloping sharply toward the sea. The composition of the requirements given herewith and the arrangement of the grounds, including access by land and water, constituted the problem. The building proper was to contain an assembly hall for 500 people with a stage accommodating 60 and such necessary facilities as dressing rooms, toilets, vestibule or loggia, and lounge. As a part of this building an outdoor theatre seating 1000 persons was required.

The Jury of Award was composed of H. P. Richmond, Philip A. Cusachs, James Ford Clapp, Niels Larsen, and Professor William Emerson of the Massachusetts Institute of Technology.

The Jury's report stated that "the winning drawing represents the most intelligent use of the site in accordance with the spirit of the program. The placing of the two essential parts of the composition in relation to view and use is excellent. There are some minor defects of arrangement and admittedly the elevation is not of great interest."

Mr. Gruzen's design, placed second, is a most ingenious solution, which in the opinion of the Jury was not in any particular sense suited to the site in question, but showed originality and careful thought.

These designs are illustrated on the following pages.

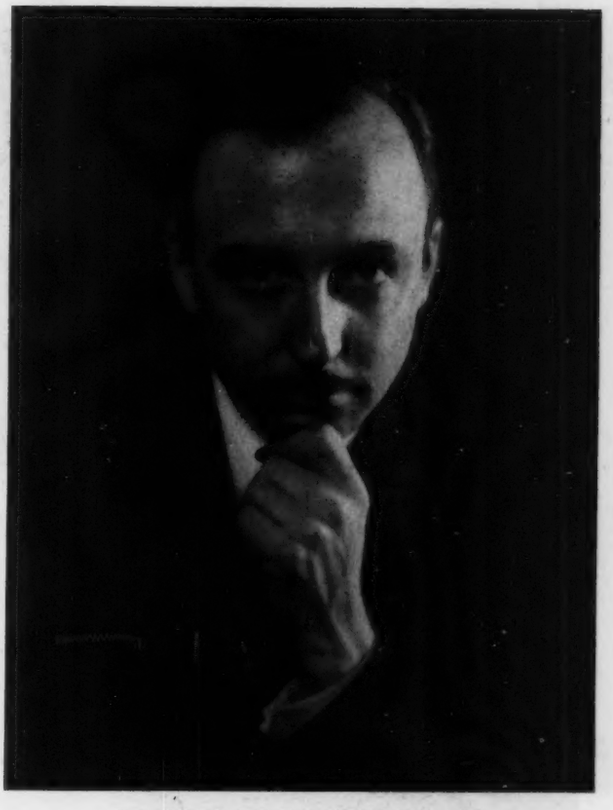
The Scholarship, which is given in memory of Guy Lowell, provides an annual award of $1,000.00 to assist draftsmen and students in schools of architecture, with three years of office experience, to benefit by six months' travel in foreign countries. The scholarship is under the direction of the Chairman of the Committee of Education of the Beaux-Arts Institute of Design, the head of the Department of Architecture of the Massachusetts Institute of Technology, and a practicing architect in Boston.

COMPETITION FOR THE GEORGE G. BOOTH TRAVELING FELLOWSHIP IN ARCHITECTURE

THE SEVENTH ANNUAL COMPETITION for the Booth Traveling Fellowship will be held as usual during the Spring recess. The preliminary sketch will be given out on April 12, the problem being developed during the two weeks beginning Monday, April 14. All graduates of the University of Michigan who have not reached the age of thirty-one on April 12 will be eligible, also students in residence under the age limit who will complete the requirements for graduation in June, 1930.

Candidates resident in Michigan go to Ann Arbor to make the drawings; those living in other States of the Union may go there for the competition, or can arrange with someone in the office where they are employed to supervise the preparation of the drawings which must be produced without criticism or assistance from others.

All those intending to compete should notify the office of the College of Architecture, University of Michigan, Ann Arbor, as soon as possible in order that suitable arrangements can be made.



CHARLES LE BOUTILLIER, JR.

CHARLES LE BOUTILLIER, JR., the winner of the Guy Lowell Scholarship for 1930, was born in Tewksbury, Massachusetts, in 1903. He attended the public schools in Lowell, Massachusetts, and in 1920 was awarded the Lowell Harvard Club Scholarship. During his work at Harvard Mr. Le Boutillier concentrated on the Fine Arts and graduated with a B. A. Degree in 1925. Following this he studied at the Harvard Graduate School of Architecture under Jean Jacques Haffner. During the summer of 1926 he attended the Fontainebleau Summer School. In 1928 Mr. Le Boutillier was a special student at the Massachusetts Institute of Technology, studying advanced design under Jacques Carlu. Since this time he has continued his studies by doing the projets of the Beaux-Arts Institute of Design at New York University under Percival Goodman, and in the Atelier Whitman-Goodman, which is conducted by his present employers. Mr. Le Boutillier has also worked in the offices of Kilham, Hopkins, and Greeley, in Boston, and York and Sawyer, in New York.

ROTCH TRAVELLING SCHOLARSHIP ANNOUNCEMENT

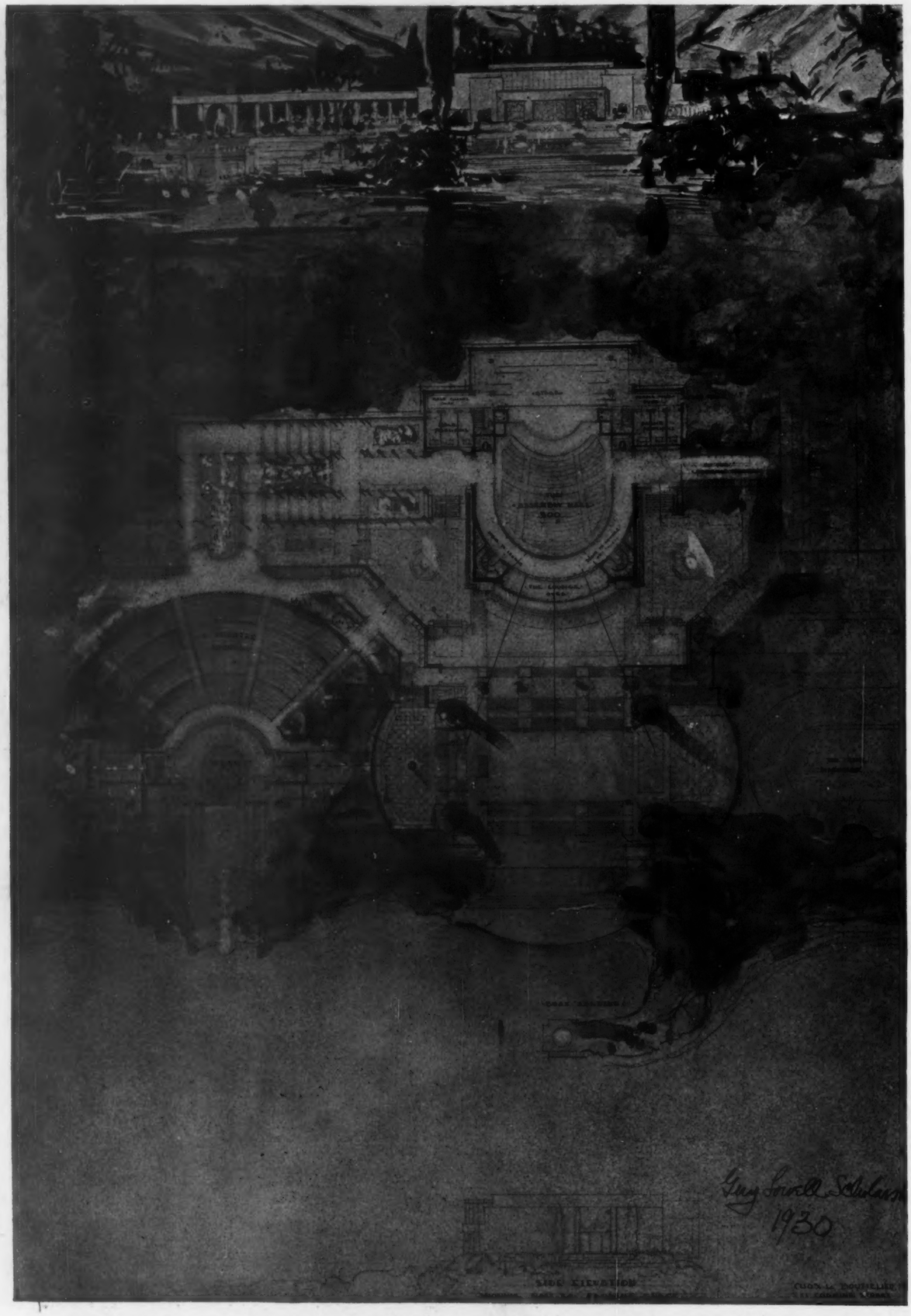
PRELIMINARY EXAMINATIONS for the Rotch Travelling Scholarship will be held this year on April 7 and 8.

There will be sketches "en loge" April 14 and 16, open to all who are eligible under rules of the Scholarship. From the logistes there will be made a selection of four (4) who will be admitted to final competition April 19.

The award will be made on recommendation of a jury, and the candidate chosen will be given the scholarship for a time to be determined by the Committee in consultation with the winner.

The amount of the prize is $3,000. The Boston Society of Architects has offered a 2nd Prize of $100 to be awarded to candidate placed Second.

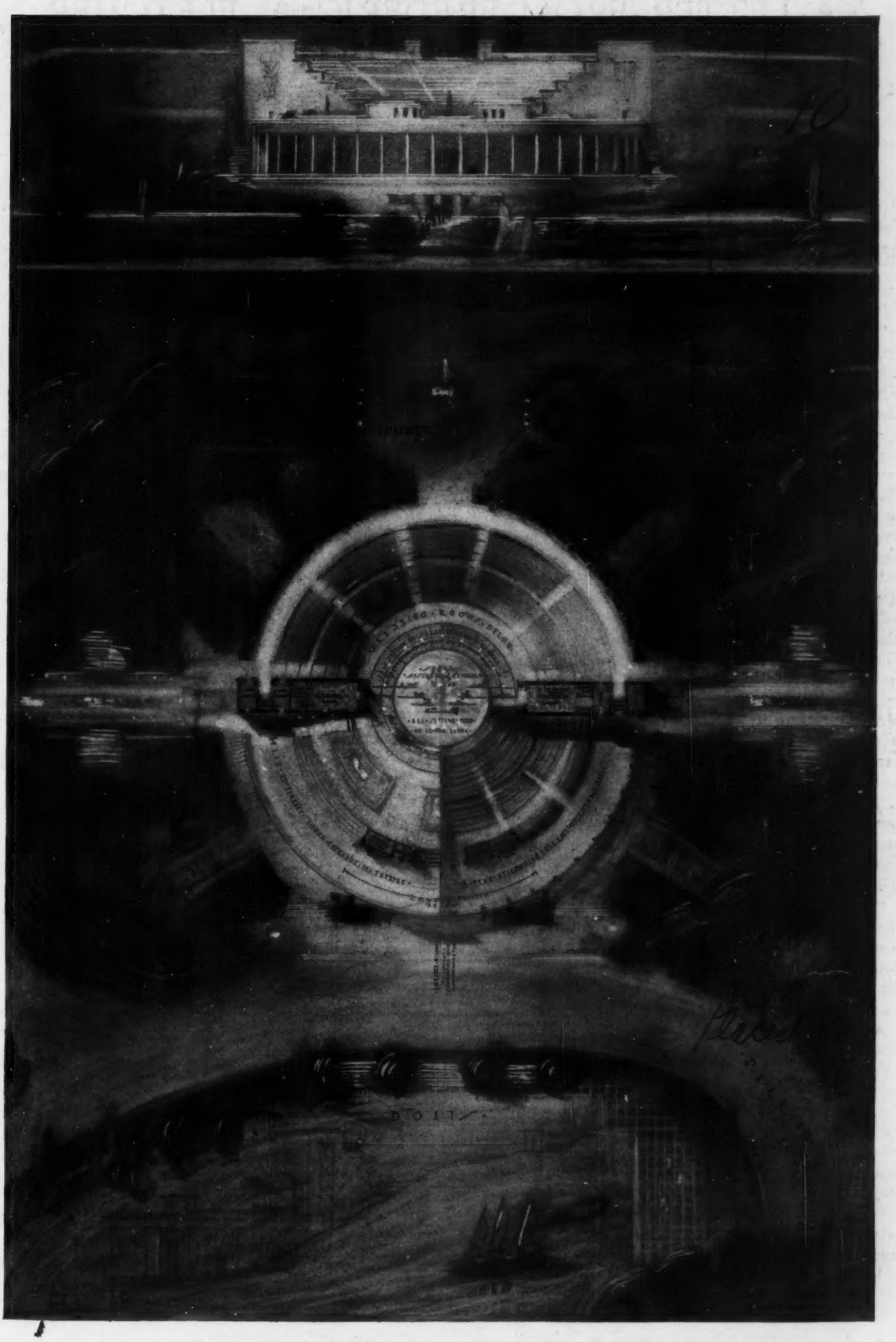
For further information apply to C. H. Blackall, secretary, 31 West Street, Boston, Mass.



WINNING DESIGN BY CHARLES LE BOUTILLIER—COMPETITION FOR GUY LOWELL SCHOLARSHIP, 1930

"AN ASSEMBLY HALL AND THEATRE FOR MUSIC AND THE DRAMA"

(See text on page 289)



DESIGN PLACED SECOND BY B. S. GRUZEN—COMPETITION FOR GUY LOWELL SCHOLARSHIP, 1930

"AN ASSEMBLY HALL AND THEATRE FOR MUSIC AND THE DRAMA"

(See text on page 289)

A LETTER FROM FREDERIC A. FLETCHER OF BALTIMORE

In Which the Question of Increasing the Architect's Percentage Charge is Brought Up for Discussion

"I AM VERY GLAD to notice that you are apparently contemplating taking a definite step concerning the education of the public with regard to the value of architectural services.

"A certain card has just come into my office. There is a motto on it which reads, 'Success in life consists in making the best of getting the worst of it.'

"That the profession of Architecture has been 'getting the worst of it,' is certain; but we have been making the best of it long enough.

"The idea now, an idea by the way which I have been advocating for years, seems to be to make a definite effort to educate the public as to the proper duties of an Architect and the reasons for employing him. This is fine, but I want to say in this connection that a good deal of the effort in the beginning should be directed toward educating those interested in the building industry itself. For every practicing architect, there are fifty contractors, subcontractors, material men, real estate brokers, developers and others affiliated with the building industry, everyone of whom maintains a closer contact with the public than the architect does and every one of whom is a potential salesman or advocate of the value of architectural services. The odds are about fifty to one that a person contemplating building will talk with one or more of these people before he talks with an architect and these people, themselves, in most cases are not entirely sold as to the value of an architect's services, nor do they recognize the architect for what he actually is; the proper logical and real leader of the industry.

"Does the average architect himself, fully realize the importance and responsibility of his position? There is a tremendous moral responsibility and there is also a legal responsibility which he cannot escape. I will give just one illustration.

"In 1922, following a heavy snow fall, the roof of a certain theatre in a neighboring city collapsed, burying several hundred people in the debris and killing between thirty and thirty-five. Subsequent testimony developed the fact that this was a job where the architect, for a reduced fee, simply 'drew plans' with the understanding that he was not to supervise. The contract for the building was given to a general contractor rated as one of the best. The action of the Grand Jury was as follows, viz:—They indicted—the General Contractor?—No. They indicted the Architect and, to keep him company, several of the Sub-contractors and a couple of the Assistant Building Inspectors. This, despite the fact that sworn testimony showed that the Architect's plans were changed during the progress of the building.

"I wish to make two suggestions for changes that are, in my opinion, vitally important, necessary, and entirely practicable:—

1—The use of the term 'Architect's Fee' is entirely wrong and injurious as well as a misnomer in the connection in which it is commonly used.

2—The Architect's 'Compensation'—'Charge'—or 'Fee (including cost and profit),' or whatever designation be decided upon, would be changed from 6% to 8%.

"In explanation of the first suggestion, my experience shows that to the layman's mind, this so-called 'Fee' is generally considered as profit comparable to the Builder's 10% profit, and it takes a deal of explaining to convince the average client that only about 45% or 50% of this is really profit and sometimes not even that.

"In explanation of the second suggestion, the Institute Schedule of Charges refers to it as a 'minimum charge,' but in their contract forms they speak of it as 'Fee.' The public does not think of this as a minimum charge but as the maximum fee, and custom has fixed it in the public mind as such and it is not nearly enough. No other business or profession calling for an equal amount of talent, training, brains, devotion and hard work and involving as much responsibility is anywhere nearly as poorly paid. The average architectural office, from the Chief down to the greenest boy, is woefully underpaid. The wonder is that the average architect can hold his head up at all, and where is the incentive to a young man to enter a profession where, after years of study and experience, he finds himself, as an employee in an architect's office, working for the wages of a bricklayer.

"It is unnecessary and entirely the profession's fault.

"Who is responsible for the generally accepted idea that a builder's legitimate profit is 10%? Why, the builder, of course. And why should a builder receive a profit of 10% plus his 'overhead' and 'general conditions,' and the Architect a paltry compensation of 6% which gives him a profit, if he is lucky, of about 3%.

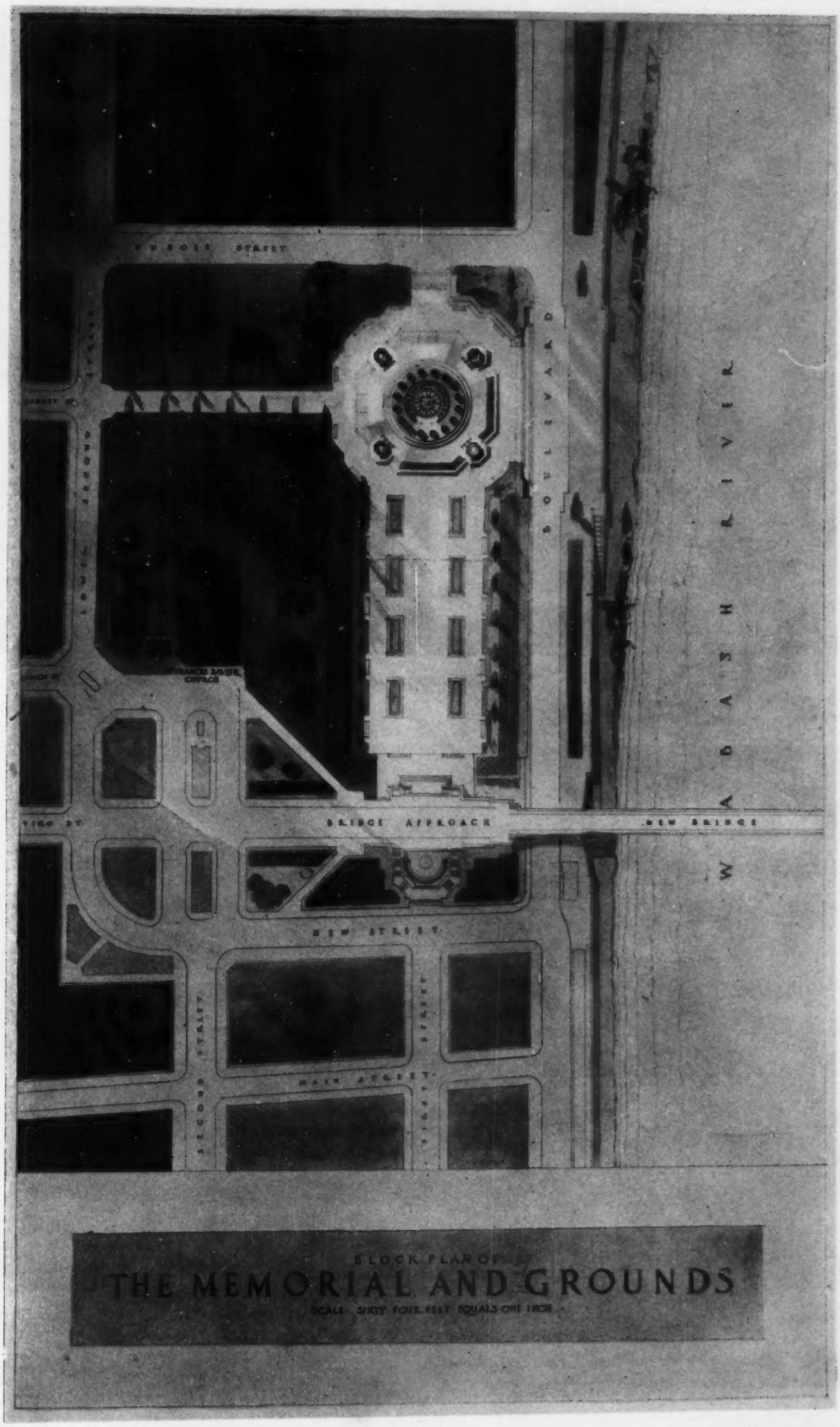
"The very fact that the Architect is so poorly paid is, in my opinion, one of the reasons that he is not more and better thought of among business men and why it seems so hard for most builders to think of him as the leader in a building enterprise. Students of psychology will understand this. People generally are inclined to take a man at his own value.

"A certain man came to my office recently to engage me in a certain matter. He had arranged his financing and in conjunction with his bankers had the figures all 'set up.' They proposed to engage a certain builder on an 'upset' contract. His overhead of about 6% was all figured in, his profit was set down as 10%, the Architect's fee as 6%, the bankers accepting that as the prevailing rate. It could just as well have been 8% or 10% for the architect, if the profession had thought it was worth that much and had promulgated the idea some time ago.

"Someone will say, 'What is the use of asking 8% when we have difficulty now in getting 6%?' My answer to this is that they would have the same difficulty if the prevailing rate were 4%, since there always have been and always will be people who hope to get something for nothing and try to drive a bargain; but if the architects are convinced that their services are worth at least 8% and have the courage of their convictions they will find it no harder to demand and receive it than it is to get the 6%.

"I have said a great deal more than I had intended but have still left a prodigious amount unsaid.

"I should certainly like to see some discussion along the line of the suggestions made in this letter."



PLAN OF WINNING DESIGN—COMPETITION FOR THE GEORGE ROGERS CLARK MEMORIAL

HIRONS AND MELLOR, ARCHITECTS

(See text on page 295)

ELEVATION

SECTION

WINNING DESIGN—COMPETITION FOR THE GEORGE ROGERS CLARK MEMORIAL

HIRONS AND MELLOR, ARCHITECTS

(See text on opposite page)

GEORGE ROGERS CLARK MEMORIAL COMPETITION

THE GEORGE ROGERS CLARK Sesquicentennial Commission was established by resolution of Congress "for the purpose of designing and constructing at or near the site of Fort Sackville, in the City of Vincennes, Indiana, a permanent memorial commemorating the winning of the Old Northwest and the achievements of George Rogers Clark and his associates in the War of the American Revolution."

The subject of the competition was a memorial structure and its terraces or accessories, it being a mandatory requirement that the structure be a building.

The program suggested "that there be mural paintings representing in pictorial form the achievements of George Rogers Clark and his associates, together with contemporary events which furthered the purposes of the War of the Revolution in the West. It should be observed that the episodes of Clark's career, both civil and military, leading to the capture of Fort Sackville are of such brilliant and dramatic interest as to be vivid subjects for mural representation."

The plan which has been developed for the memorial grounds was a fixed condition of the program insofar as it was fixed upon the ground by construction work completed or started before the competition terminated. The construction work which was completed or started before that time is the bridge and its approach, and the river wall, as shown in the plan of the winning design on page 293. The river drive was a fixed condition of the program, and it must pass under the bridge approach at the point shown on the ground plan, as the necessary headroom can be had only at that point. Any necessary adjustments in the details of the ground plan, which did not involve the fixed conditions set forth will be made through collaboration between the architects of the grounds—Bennett, Parsons, and Frost, of Chicago—and the successful competitor.

William E. Parsons of Chicago was appointed architectural adviser by the Commission. The competition was open to architects practicing architecture in the United States who are American citizens.

The winning design by Hirons and Mellor, New York architects, is shown on pages 293 and 294. Some of the other designs submitted in the competition will be published in the May issue, together with comments on the designs by the Jury of Award.

TWO FELLOWSHIPS IN ARCHITECTURE

UNIVERSITY OF PENNSYLVANIA

TWO ONE-THOUSAND-DOLLAR Fellowships in Architecture, gift of an anonymous donor, are announced for the year 1930-1931. The Fellowships will be awarded to the winners of a Competition in Design to be held from 9:00 A. M., Saturday, May 10, 1930 (local standard time), to 9:00 A. M. Saturday, May 17, 1930 (local standard time). Each candidate selected for the competition will take this locally in compliance with the governing regulations.

Candidates of high standing from approved institutions or ateliers will be selected for the competition by the Fellowship Committee from applicants on the basis of record, recommendations from School Heads and patrons of ateliers, and samples of work done by the applicant in Class A, B.A.I.D. competitions, or equivalent grade at the applicant's institution. The samples of work will be returned to each applicant after inspection.

The competition will be judged shortly after the rendu by a jury, whose chairman will be Dr. Paul P. Cret, chief of the staff of design in the Department of Architecture, University of Pennsylvania.

The candidates selected shall agree to perform and complete at the University of Pennsylvania the full year's program in Design, and other subjects as may be required of them, giving full roster time to this program. If the holder be a candidate for a degree, he shall agree to give his full time to the prescribed course.

The holder, if eligible, will take as part of his required work competitions for foreign travelling scholarships, such as the Paris Prize, Fellowship of the American Academy in Rome, Le Brun Prize, and so on.

The holder of the fellowship will pay the regular tuition and other fees.

Applications must be made by letter to the Chairman of the Committee on Prizes—Professor Harry Sternfeld, School of Fine Arts, University of Pennsylvania, Philadelphia, Pa. The application must be accompanied by records, recommendations and specimens of work, as mentioned above and a statement that the applicant will enter the competition if approved as a competitor. The applicant must, at the same time, apply for admission as a student to the University of Pennsylvania, this act, of course, not committing him to attendance in case he should not be awarded the Fellowship.

Applicants must be able to pass the entrance requirements of the University if they have not already passed the college entrance requirements elsewhere.

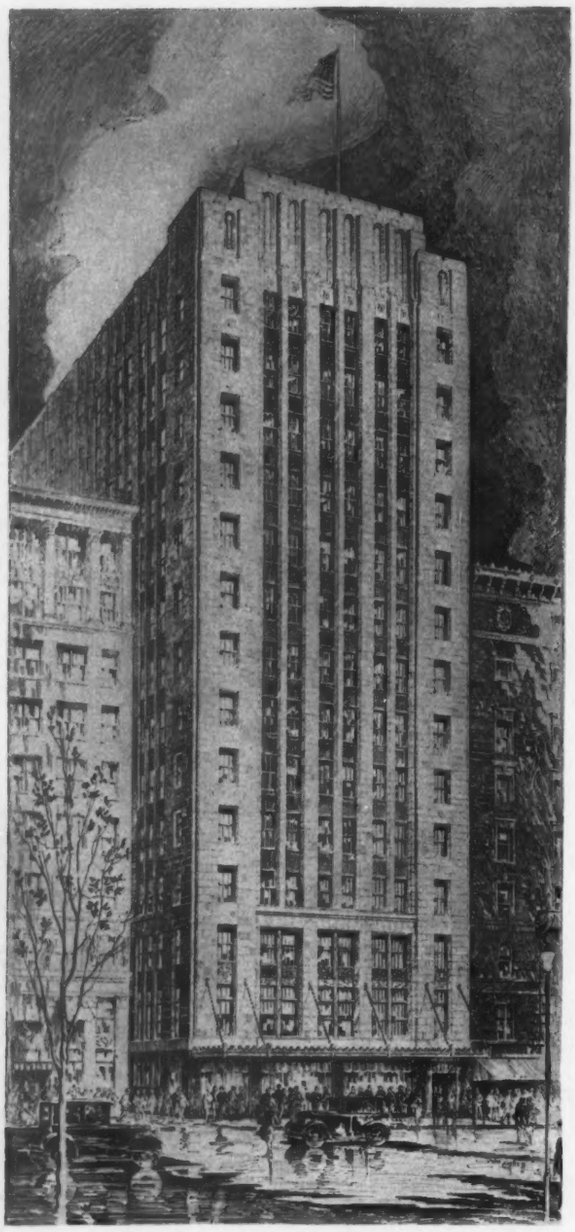
Applications must be mailed to bear postmark of date not later than Saturday, April 12, 1930.

ABOUT MALCOLM OSBORNE

MALCOLM OSBORNE, one of whose plates is reproduced as a frontispiece in this issue of PENCIL POINTS, was born in Somersetshire in 1880. His art training has been exceptional. "He first studied art at Bristol and came to London with a Scholarship for the Royal College of Art; but it was not until he had tried in turn sculpture, architecture, black-and-white design, and book-illustration that he finally found his ground in engraving, and set himself to master every form of it under Sir Frank Short. After five years of hard study he sought still further training in the exactive translative work of the painter's engraver. In 1906 he was elected to the Painter Etchers' Society, and it was while on active service in 1918 that his election as an Associate Engraver of the Royal Academy was announced. If this distinction was primarily a recognition of the merit for which this particular class was first created, his election as a full Academician in 1926 has no such limited significance. In his landscapes on copper the complete vision of a master was revealed, and in etched portraiture Osborne has reached the heights of creative expression. He has crowned his brilliant career by succeeding Sir Frank Short as Professor of Engraving at the Royal College of Art."

"We sometimes forget what the fine craftsmanship of an artist like Malcolm Osborne really signifies—that it is the warranty of his art. The power to express that can be acquired in the schools must ultimately be lost if it is not unremittingly fostered by the sheer need to express, if the artist does not recognize in the medium given him his one means of deliverance."

"Malcolm Osborne's entire work shows that when once craftsmanship has liberated the spirit of expression, that spirit dictates all that follows, the creative activity impelling its instrument towards ever more perfect response."
—*From unpublished Notes on Modern Etchers, by Max Judge.*



BUILDING FOR THE ELECTRIC ILLUMINATING COMPANY OF BOSTON

BIGELOW, WADSWORTH, HUBBARD, AND SMITH, ARCHITECTS

THE BUILDING SHOWN by the accompanying rendering will be the first electrically welded building in Boston. It will have 14 stories, and will be 60 ft. wide, 112 ft. deep, and 155 ft. high. A total of 1,200 tons of steel will be used in the structure. The entire field fabrication will be done by electric arc welding. Its progress will be watched with interest by architects for it will be one of the earliest electrically welded buildings of architectural importance to be built in this country.

PRATT ARCHITECTURAL CLUB

IT IS WITH DEEP REGRET that we announce the death of one of our members, William J. Crichton, Class of 1912, on February 17, at Hazleton, Pa. After teaching at Pratt Institute for a time, Mr. Crichton went to Hazleton and engaged in the practice of architecture with Peter B. Sheridan, also a Pratt man. Following this he started his own practice which was very successful. His many friends extend sincerest sympathy to his family.

On March 11, the Annual Open-House Meeting was held at the Fraternity Club with a spirited discussion on the general affairs of the club. This was followed by a novel and most interesting talk by "Johnny" Hayes, the old American Olympic Marathon Champion, on American Sports. Some of Mr. Hayes' anecdotes of the various incidents and doings of our older champion athletes were highly amusing—and he was voted the thanks of the entire club.

Plans are now in full swing for the Annual May Meeting and Dinner under the guidance of H. Eugene Child, '14. The event this year will be held on May 7th at the Fraternity Club, 38th Street and Madison Avenue, New York, and preparations are being made for our biggest affair. We have been fortunate in securing as our guest speaker, a man who is in great demand, Mr. H. C. White, of the Edison Lamp Works, of the General Electric Co. Mr. White will talk on and demonstrate the *Wonders of Modern Lamps* and we have been informed that those fortunate enough to have heard him before have been most enthusiastic in their praise. This night will also be Reunion Night for the Classes of 1925, 1920, 1915, and 1910, so we hope to reach through PENCIL POINTS all old Pratt Architects in distant parts; jot down the date, May 7th.

A NEW SERIES OF KNOBLOCH CONSTRUCTION DETAILS

IN THIS ISSUE we are presenting the first of a new series of construction detail plates drawn by Philip G. Knobloch, who is well known to most of our readers as the author of two volumes on *Good Practice in Construction*. The plates will appear from now on, until further notice, two in each issue.

The current pair, showing a refreshment bar, was worked up from data supplied by the office of LeRoy P. Ward, Inc. The next set will be on "Concealed Flashing."

We wish to call attention to a minor change which should be made in the upper right-hand corner of the plate showing sections through the bar, where the scale of the small profile of the finger ledge is stated as "full size." This should have been written "half full size." The error was discovered too late for correction before going to press.

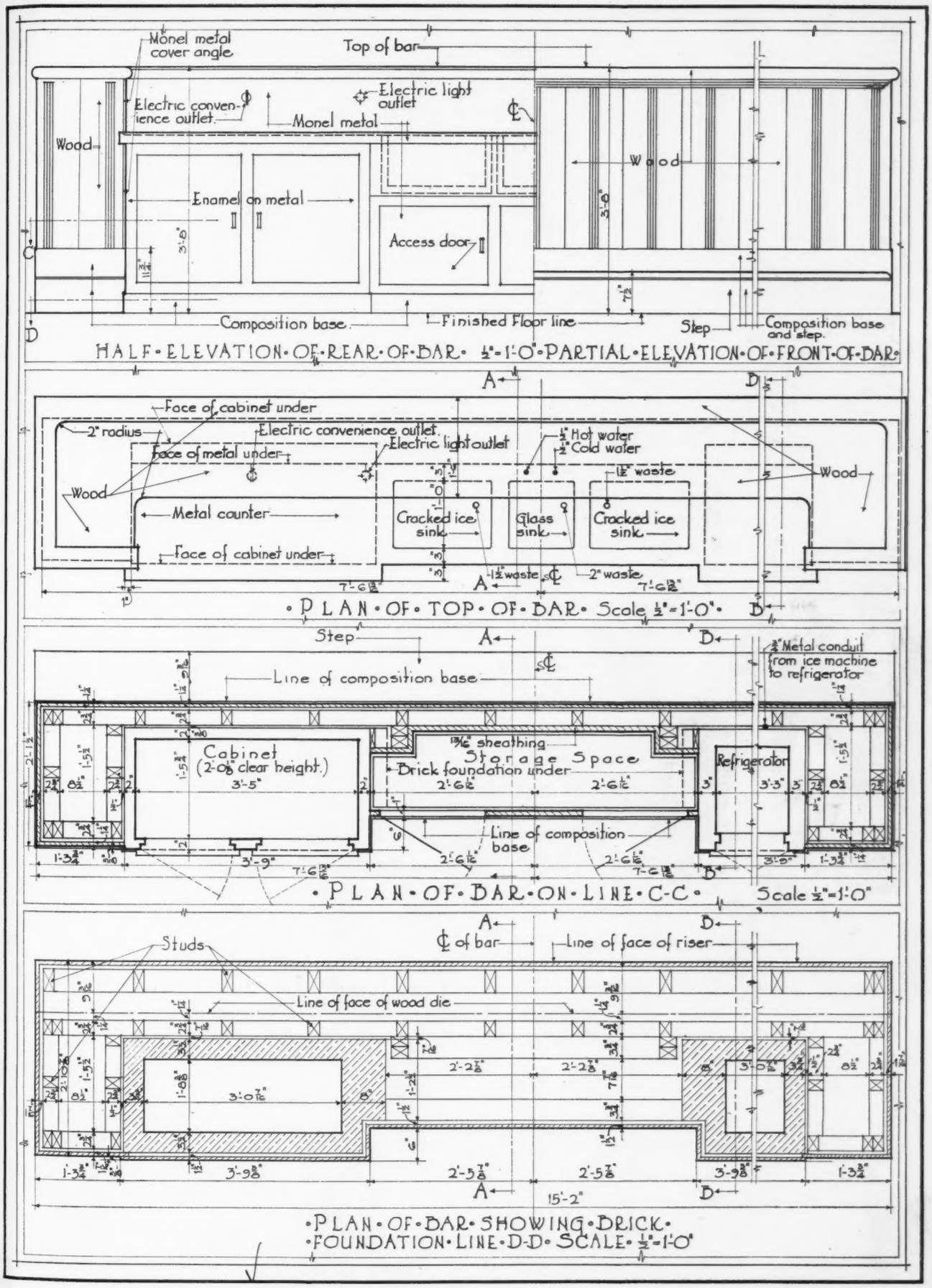
CHARCOAL CLUB ATELIER

THE CHARCOAL CLUB ATELIER of Baltimore, Maryland, has elected the following officers: Harry Sopher, Massier; Joseph L. Betlejeski, Jr., Sous-Massier; and Pieter C. Pauw, Librarian. Louis Fentnor is the sole patron of the atelier.

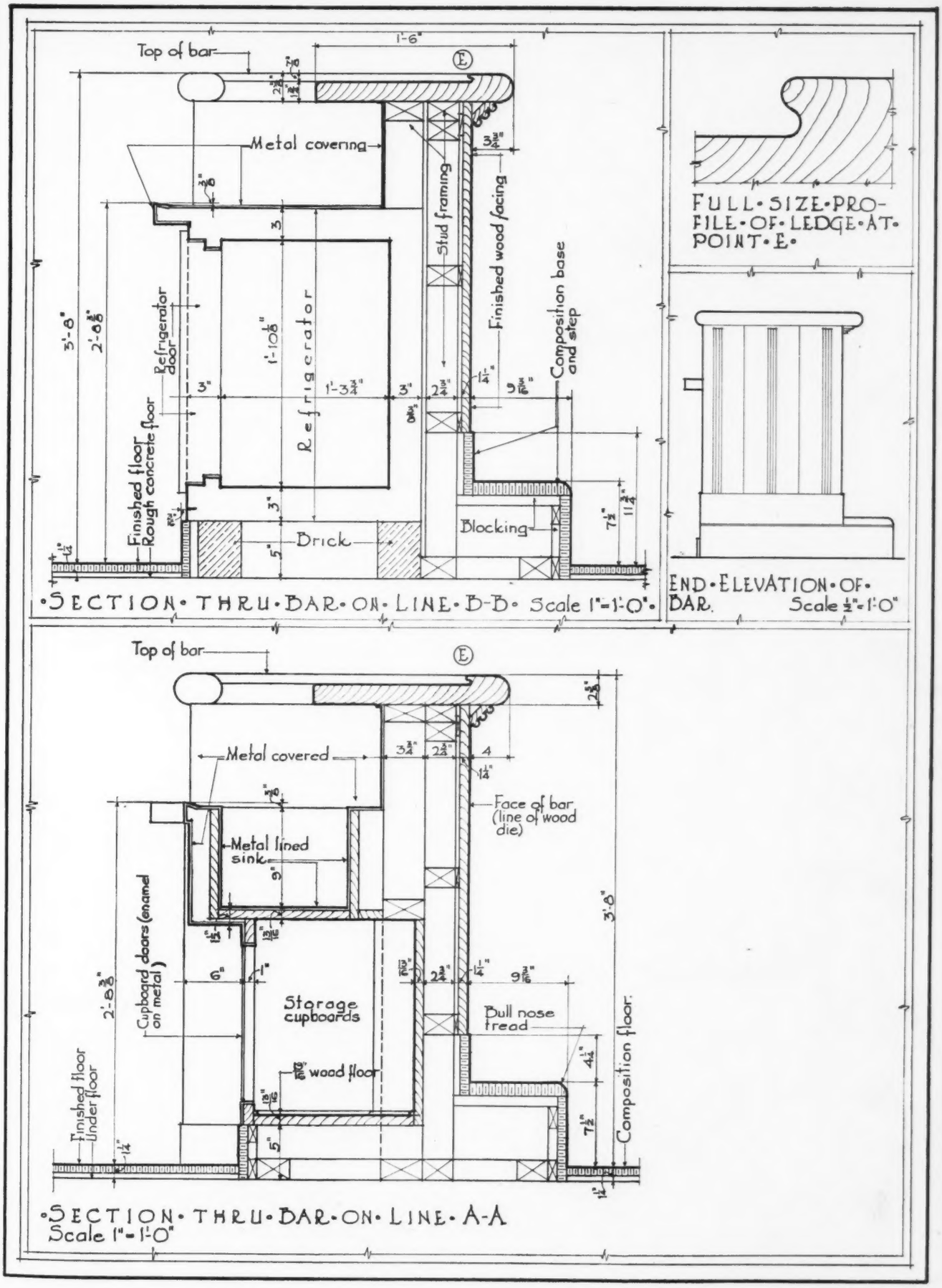
CORRECTIONS

IN THE ADVERTISEMENT of the Nailcrete Corporation, which appeared in the March issue of PENCIL POINTS, the Riverside Church in New York was attributed to Allen & Collens, architects. Credit should have been given to Henry C. Pelton and Allen & Collens.

THE NAME OF THE architectural firm was inadvertently omitted in connection with the Capt. W. G. Roper residence illustrated in the Libbey-Owens Glass Company advertisement which appeared in February PENCIL POINTS. The Capt. Roper residence was designed by Cooper and Cooper, Architects, of Atlanta, Georgia.



DETAILS OF CONSTRUCTION FOR A REFRESHMENT BAR—DRAWN BY PHILIP G. KNOBLOCH



SECTIONS—DETAILS OF CONSTRUCTION FOR A REFRESHMENT BAR—DRAWN BY PHILIP G. KNOBLOCH

COLLABORATIVE COMPETITION

SPONSORED BY THE AMERICAN ACADEMY IN ROME ALUMNI

THE ASSOCIATION OF THE ALUMNI of the American Academy in Rome, wishing to encourage the participation by students of painting, sculpture, and architecture in collaborative problems, issued a program for the treatment of an interior of a sanctuary.

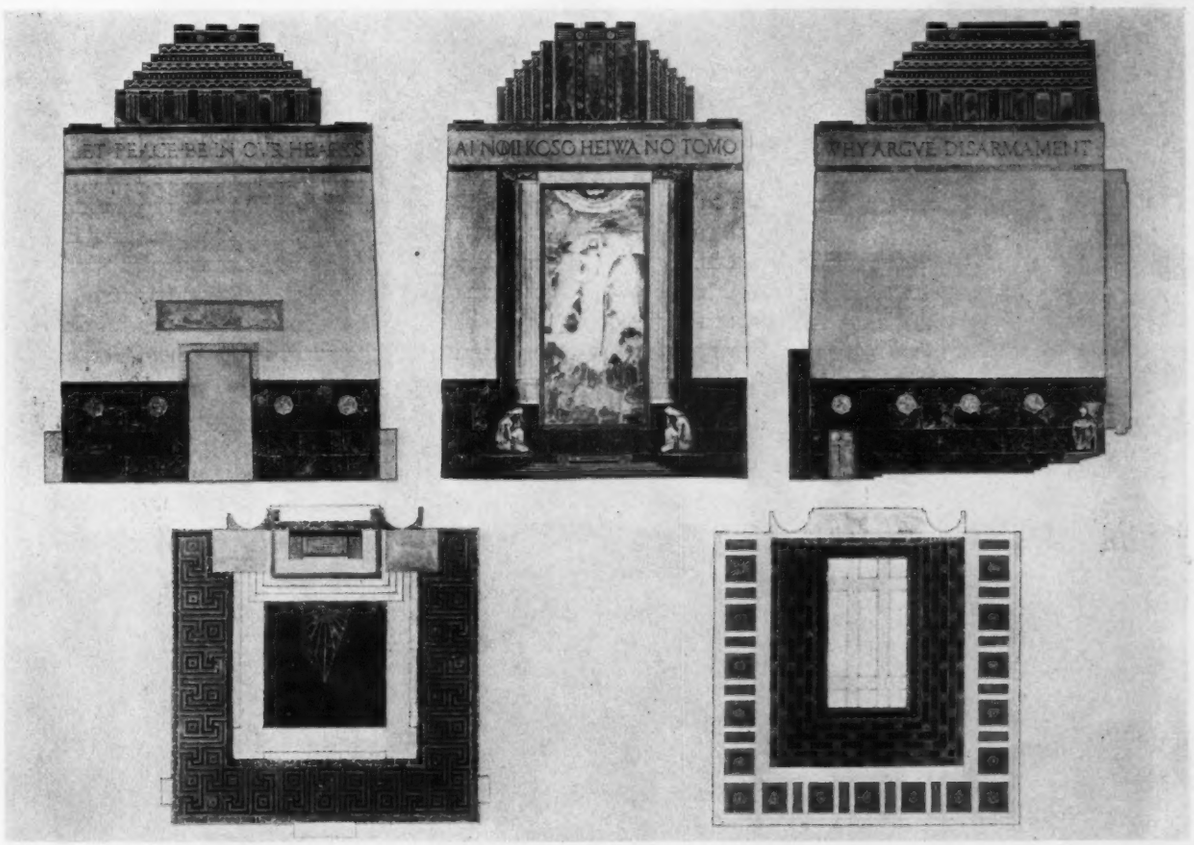
The competition was open to any group of students in schools of art or ateliers, or to anyone employed in offices or studios. The problem could be done under the supervision of a patron, but the designs had to be the work of the competitors.

The Problem: The body of Woodrow Wilson is now temporarily buried in Washington. A group of his friends desire to erect for him and his family a final resting place that shall typify what this man represented to them—a great sociologist and idealist who labored and devoted his life to the furtherance of international peace and tolerance.

The entrance, from the north, is into the main sanctuary which shall not exceed fifty feet at its greatest horizontal dimension. The vertical dimension shall not exceed seventy-five feet. This sanctuary may be lighted by windows or top light and may take any shape. To the right and left are smaller doors leading to the two actual burial vaults. There is to be a main feature, which may be an altar, a tabernacle, sculpture, sarcophagus or what, in the estimation of the designer, is most appropriate. The decorations are left to the discretion of the designer and may con-

DETAIL OF SCULPTURE BY TAKANOBU AJIKI

ONE OF A PAIR FLANKING THE PAINTING



FIRST MEDAL WON BY CORNELL UNIVERSITY TEAM—SHIGEO HIRATA, ARCHITECT; TAKAYOSHI YODA, PAINTER; TAKANOBU AJIKI, SCULPTOR

COLLABORATIVE COMPETITION SPONSORED BY THE ALUMNI OF THE AMERICAN ACADEMY IN ROME

DETAIL OF SCULPTURE BY CURTIS S. HAMILTON

sist of mural paintings, stained glass, or mosaics. Portrait statues are barred.

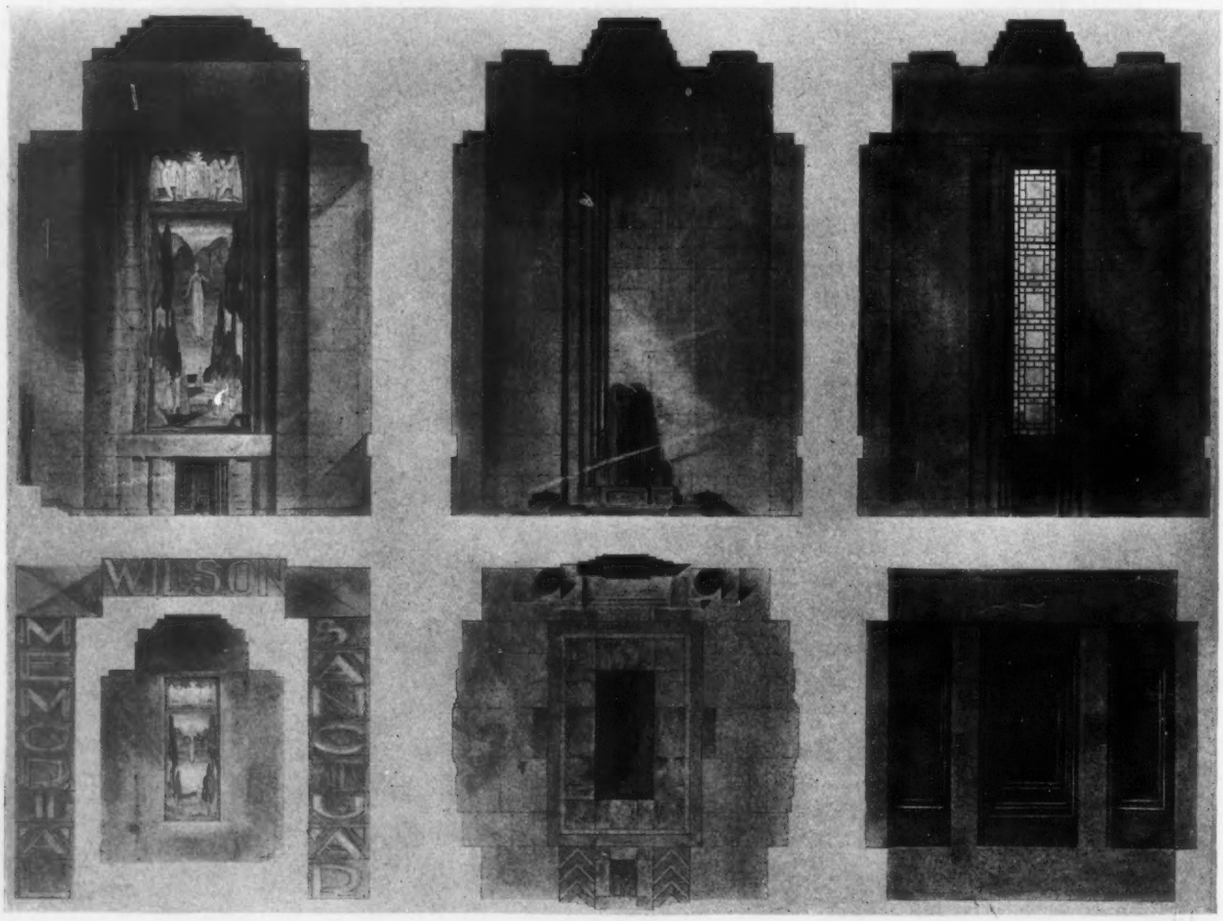
Eight schools were represented in the competition: Armour Institute of Technology in collaboration with the Art Institute of Chicago entered two teams; Cooper Union and Cornell University each had one team; Syracuse entered ten teams; University of Pennsylvania, collaborating with Pennsylvania Academy of the Fine Arts, three teams; at Yale University School of Fine Arts thirty teams collaborated. The total number of teams was 47 and 32 of these received awards, including two first medals, nine second medals, seven first and fourteen second mentions.

The Jury of Award was composed of Thomas H. Ellett, James K. Smith, Leo Friedlander, Paul Manship, Berthold Nebel, Barry Faulkner, Eugene Savage, and Frank Schwarz.

Two first medals were awarded—one to a Cornell Team, and the other to a Yale Team, as shown herewith.

Commenting upon the design submitted by the Cornell team the Jury report stated: "This is a simple, strong plan and the accent is on the main wall where it should be. Strong presentation. Color scheme is excellent. Design of the floor and ceiling is very good. The painting has a very adequate style. Color and tone go excellently with the architecture. Good collaboration of the three arts."

Commenting upon the Yale team design the Jury report stated: "This is an impressive, simple plan, possessing great dignity. Sculpture in relation to the wall where it is placed has nobility. The painting is weak in composition. The main wall is composed of a series of very good shapes. The rendered sculpture is better than the model."



FIRST MEDAL WON BY YALE UNIVERSITY TEAM—WILLIAM B. CRAM, ARCHITECT; MABEL K. SALOOMEY, PAINTER; CURTIS S. HAMILTON, SCULPTOR

COLLABORATIVE COMPETITION SPONSORED BY THE ALUMNI OF THE AMERICAN ACADEMY IN ROME

ARCHITECT; HOME BUILDER; MANUFACTURER—A TRINITY

By Raymond Hawley

THE ARCHITECT PROVIDES the plan—the home builder provides the money—the manufacturer provides the materials. Each is indispensable to the other; yet at times they seem to be working at cross purposes, or at least with less than that harmony or mutual understanding of interests that makes for the most efficient results.

Certain of the architects seem to have resented advertising on the part of manufacturers to home builders, whether of new structures or additions or alterations to present ones. Architects in some instances have objected to Mr. and Mrs. Home Builder knowing what they want and specifying it. Certain home builders have objected to seeming stubbornness or arbitrary attitudes on the part of architects. Certain manufacturers have objected to lack of cooperation on the part of architects, and so on. There seems to be some justification in the contentions of each.

The fact remains, though, that Mr. and Mrs. Home Owner are getting more up-to-date, modern, and better equipped homes in many ways than ever before. Advertising of the manufacturer to the consumer has been to a large degree responsible. True, where a manufacturer pleads his cause with great fervor, his products may have been used at the expense of eliminating certain construction features, which the architect regards as essential.

Certain architects have taken the stand that they are being put in the unpleasant positions of being little more than purveyors of square feet; that their inspirational, aesthetic, and creative talents are permitted inadequate scope. Their ability to have a much freer hand is greatly aided by the advertising of certain manufacturers who so well appreciate that the merit of their appeal rests on beauty, as well as utility.

Beauty and design are just as essential as utility if that dream house for which Mr. and Mrs. Home Owner have saved for so many years (and in many instances will be paying for long after occupancy) is to be a perpetual source of pride—a thing of beauty, a joy forever. With most, this building is a "once in a lifetime" proposition.

Let's look at the matter of builders' hardware and locks for a minute. This seems to have been one of the most difficult phases for the architect to have the home builder regard in its true perspective. To most home builders it has been just an "allowance"—a mere expense—worthy of only the most casual, if any, consideration.

Nevertheless, hardware probably gets more active use than most anything else in the home. The hinges are swinging to and fro many times daily. The catches on the windows are being continuously fastened or unfastened; the mechanism of the locks must unfailingly and repeatedly function, and the locks must deny admittance to the unauthorized. The ornamental hardware on the outside, not merely provides security, but it is continuously exposed to the weather and storms. It must be of materials and finish impervious to the elements, if it is to retain its grace and charm. Then, too, the design should be in keeping with the house.

Seldom were the locks and builders' hardware determined upon by the owner, despite the architect's insistence, when the home was planned. In comparatively rare instances were they selected when the foundation was dug or when the frame work was pretty well along. Even then, all too infrequently is brass or bronze hardware specified.

No; hardware is just an "allowance" to be slashed for this and for that. A larger automatic refrigerator is desired, lop something off the hardware; or a greater capacity heating plant, or this and that; just take it from the hardware "allowance." Even though the "allowance" was adequate initially, it frequently holds the world's record for shrinkage.

Despite opinions to the contrary, builders' hardware is decidedly conspicuous in the home; despite the erroneous impression it's just an ordinary and necessary feature. It can be the final element which makes or mars. If incongruous, with lack of harmony or suitability, its inconsistency can be absolutely glaring. Therefore, to increase their own sales, to strengthen the architect in his recommendations for hardware of beauty, value and utility, and to educate the consumer on its importance, certain manufacturers are making noteworthy and profitable contributions to the general cause in their advertising.

Only in comparatively recent years have you seen much of a play on suitable builders' hardware in the home. Not only was the harmony of beauty and suitable metals neglected, but the vital protective element as well. The architect was unable to stem the thought in the consumer's mind that low price was the only determining factor.

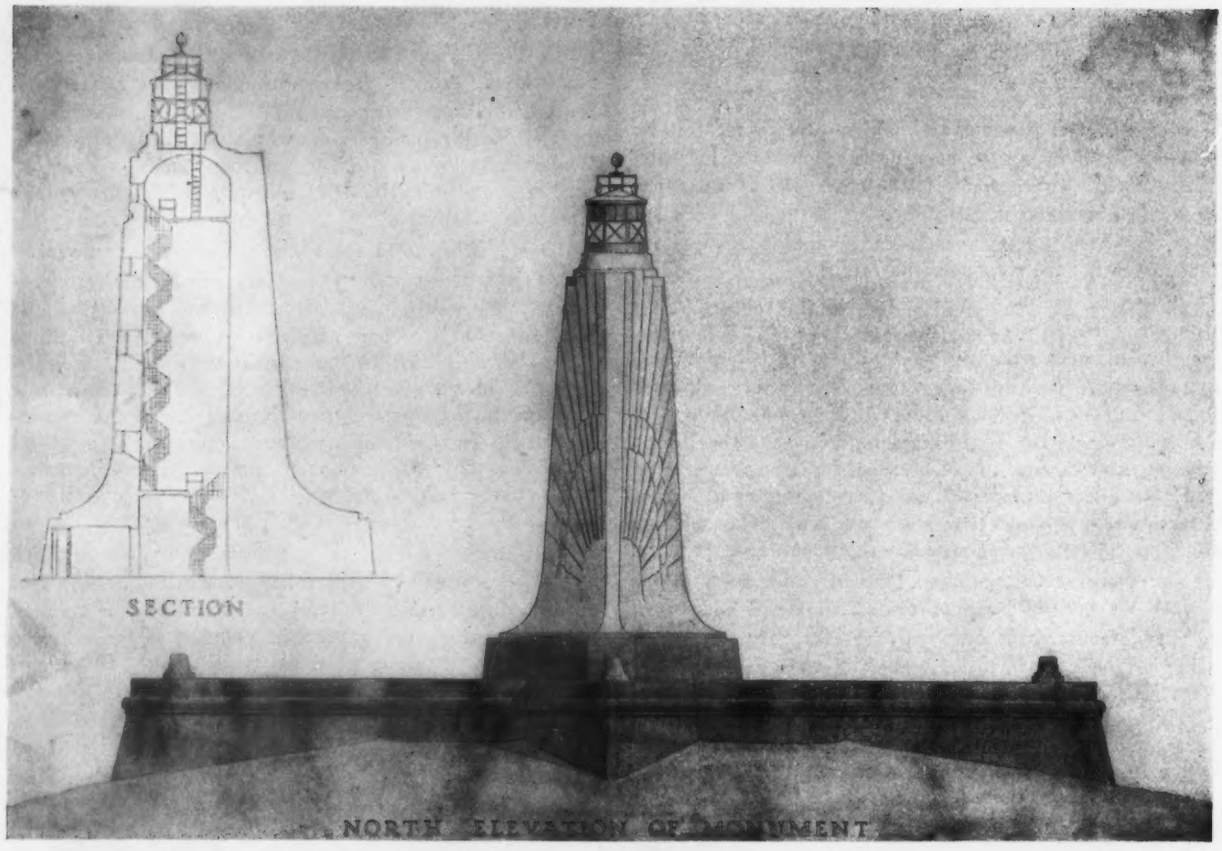
There has, for instance, been a far greater use of brass and copper pipe, leaders, and gutters the past several years. It certainly was not news to the architect that such articles were a better buy for the home owner. Despite his knowledge, however, he had not been able to bring about popularity, purchase, and appreciation. It took consumer advertising by the manufacturers to do it. Such advertising certainly strengthened the architect's hands and resulted in benefit to all.

The real aim in home building is not merely how much, but how good. The better the coordination of architect, owner, and manufacturer, the better the homes will be. The architect alone cannot possibly hope to educate the consumer, and he will find it most advantageous to view the manufacturer's advertising along broad-gauge lines.

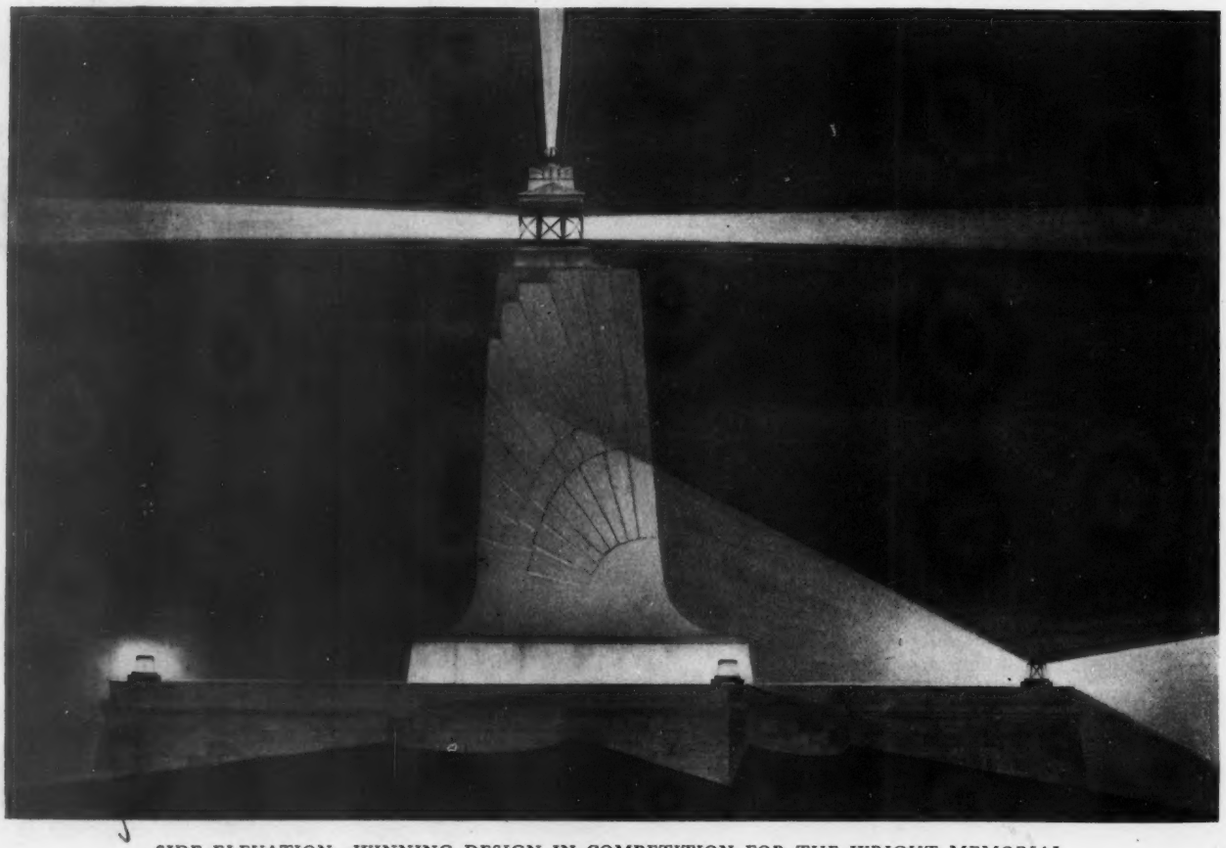
Few intelligent home owners, parting with their hard-earned dollars, will close their minds to helpful suggestions and constructive, practical advice from capable architects, who acquire their wisdom and lore through painstaking education, study and experience. At the same time, the home builder who pays the bills, after friendly discussion, is entitled to what he wants. When a man knows what he wants and demands it, the responsibility is not then solely the architect's if things don't work out as anticipated.

The home builder, through his own personal and business purchases, has learned the value of the trade-marked articles which tell their story honestly and continuously. He frequently wants trade-marked articles throughout his house and he is going to have them. He knows then that he does not have merely to rely on his own judgment or the judgment of his advisor. He knows that the manufacturer, through his national advertising and by his trade-mark, sets his guarantee upon the commodity.

Architect, manufacturer, and home builder constitute a trinity. They have much in common, for the desire of each is better homes. While it doubtless is annoying frequently to architects to have home builders come in with preconceived notions which may be ridiculous, yet the advertising of the manufacturer on the whole has been decidedly beneficial to all.



NORTH ELEVATION AND SECTION

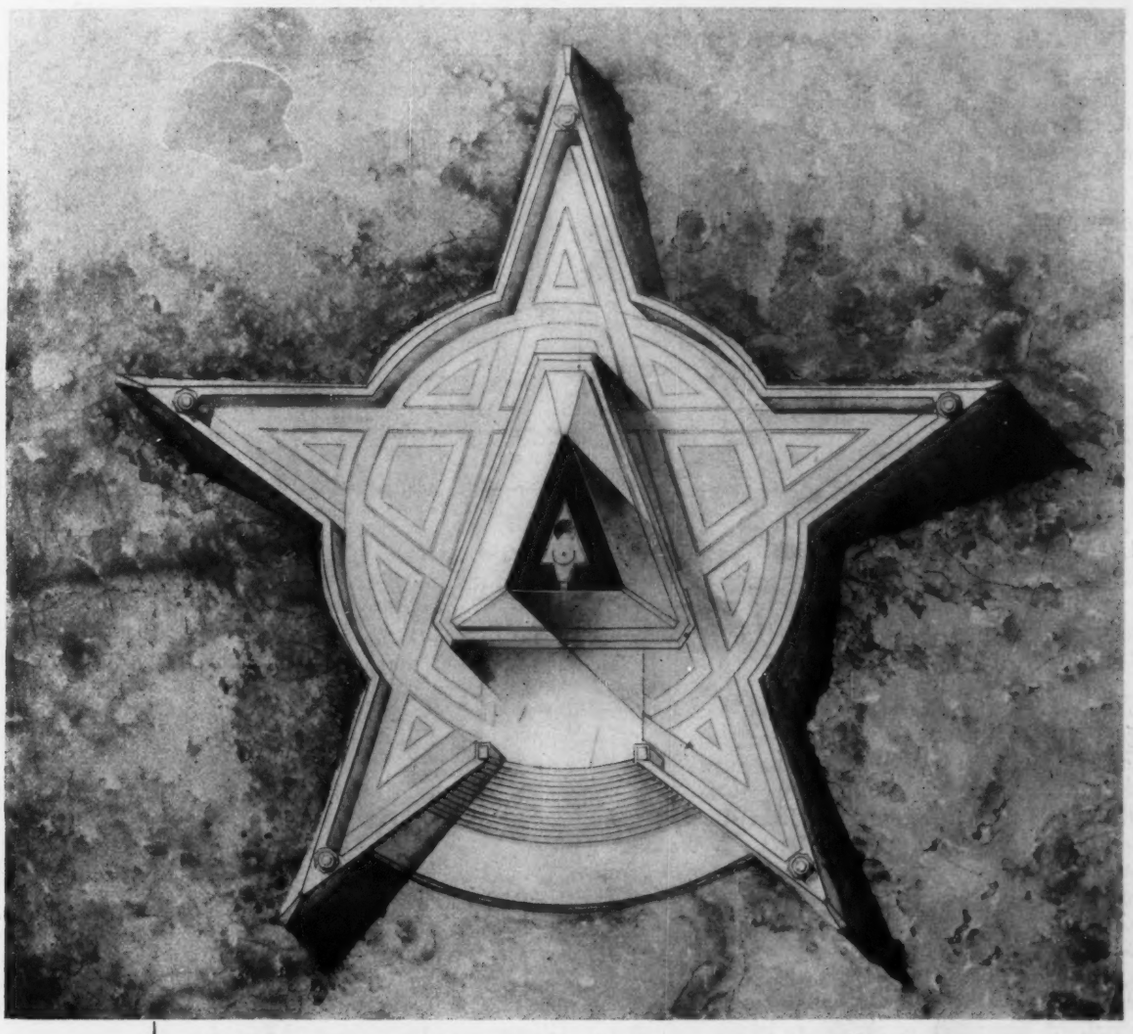


SIDE ELEVATION—WINNING DESIGN IN COMPETITION FOR THE WRIGHT MEMORIAL

ROBERT PLINY RODGERS AND ALFRED EASTON POOR, ARCHITECTS

(See text on page 306)

SITE AT KITTY HAWK, N. C., WHERE THE MEMORIAL WILL BE ERECTED



PLAN OF WINNING DESIGN—COMPETITION FOR THE WRIGHT MEMORIAL
ROBERT PLINY RODGERS AND ALFRED EASTON POOR, ARCHITECTS

(See text on page 306)

CONTE CRAYON DRAWING BY LEO SORETSKY

WRIGHT MEMORIAL COMPETITION

THE ACT OF CONGRESS of March 2, 1927, provided that there be erected on Kill Devil Hill at Kitty Hawk, North Carolina, "a monument in commemoration of the first successful human attempt in all history at power driven airplane flight achieved by Orville Wright on December 17, 1903."

The program of the competition stated that the monument "is to be a tower with provision made for lights which will serve as beacons for aviators and for ships at sea."

Kill Devil Hill, the site of the proposed memorial, is a group of enormous sand hills or dunes, entirely devoid of vegetation, which rise from a flat plain of sand covered with grass. The constant action of heavy northeast winds has moved these hills in a southwesterly direction. In order to arrest this movement, the Government will plant certain types of grass and shrubbery. The hills are about one mile from the seacoast and can be seen for miles in every direction. They are monuments in themselves. From the largest of these hills, which is ninety-seven feet high (shown in the photograph on the preceding page), Wilbur and Orville Wright made thousands of gliding flights during the three years from 1900 to 1903, and from a point near the base the first successful power driven flight took place on December 17, 1903.

It was required by the program that the monument be designed to be seen from great distances and that it support a standard lighthouse lantern of the fourth order, which could be reached by means of an interior stairway.

The Jury of Award consisted of Edward W. Donn, Jr., Frederick V. Murphy, and William H. Lord, Washington architects. The Jury's selection was approved by the Commission of Fine Arts and a joint committee of the Library Board.

Rodgers and Poor, whose winning design is shown on pages 304 and 305, received a five thousand dollar prize and are the supervising architects in the construction of the memorial. A description of the design by the architects is of interest: "the memorial will be a pylon suggesting huge upraised wings, symbolizing the birth of flight. Sharply triangular in plan, the monument is meant to convey the effect of forward motion and speed. The apex of the triangle points down the landing field, and its flat face confronts the land approach, with an inscription legible at a great distance. A more detailed description encircles the plinth of the monument. The pylon is set upon a star-shaped basis, forming the insignia used on the military and naval planes of the United States. Thus the monument will serve as a distinctive day mark for airplanes, as well as supporting a lighthouse and airplane beacon."

The Jury of Award in making its recommendation to Secretary Davis stated that: "The design selected is one which stood out from all the rest by reason of its extreme simplicity. The power of imagination manifested by the authors strikes one at first sight and increases on acquaintance. It is not only most original and impressive as seen from land, but would also be extremely effective as seen from the air."

DETROIT ARCHITECTURAL BOWLING LEAGUE

WITH BUT FOUR more weeks of bowling this season, there are several teams still in the running. The final results will be announced in next month's issue of PENCIL POINTS.

The team standings on February 28 were as follows:

	W.	L.
Robert O. Derrick, Inc.	45	24
McGrath & Dohmen	43	26
Albert Kahn	42	27
Smith, Hinchman & Grylls	39	30
Mueller & Krecke	36	33
Donaldson & Meier	34	35
VanLeyen, Schilling & Keough	31	38
Malcomson & Higginbotham	28	41
Weston & Ellington	25	44
Louis Kamper	22	47

And the team and individual records to date:

High team score 1 game—Albert Kahn —1052
" " " 3 games—McGrath & Dohmen—2864
High individual score 1 game—Thompson (A.K.), Cook (R.O.D.) —267
" " " 3 games—Jolson (R.O.D) —684
High individual average—Kalsched (A.K.), Jolson (R.O.D.), Gleasman (R.O.D.) —186
Most 200 scores—R. Fraser (V.S.&K.) —21

THE ECONOMIC HEIGHT OF THE SKYSCRAPER

AN IMPORTANT STUDY to determine the economic height of buildings in relation to the value of the property upon which they are built has just been completed by the American Institute of Steel Construction. The study was carried on during the past two years under the direction of W. C. Clark, Chief Economist and Vice-President of S. W. Straus & Co., and was undertaken for the purpose of proving that tall buildings in congested centers are economically advisable. The report found that buildings of 75 stories are not only economical but that under certain conditions they will return more on the investment than buildings of 50 stories or 30 stories.

These conclusions were based upon investigations made upon specific plans for buildings of varied heights drawn by J. L. Kingston, architect, of the staff of Warren and Wetmore. In making the studies the cooperation of numerous experts was enlisted, such as Stephen F. Voorhees of Voorhees, Gmelin, and Walker; R. H. Shreve of Shreve

and Lamb; David Lindquist, Chief Engineer of the Otis Elevator Co.; S. F. Holtzman and David C. Coyle of Gunvald-Aus, Consulting Engineers; Levering and Garrigues and McClintic-Marshall, steel fabricators; Otto Goldschmidt, Consulting Engineer and expert on mechanical equipment; Hatzel and Buehler, electrical contractors; W. G. Cornell Co., plumbing, and in the building managers and rental field such experts as Lee Thompson Smith, Clarence T. Coley, and William C. Demorest.

A study of the economic possibilities requires the careful consideration of various factors which enter into the physical construction, the rental outlook, and the restriction laws surrounding skyscrapers. Among the important factors noted in the investigation were the following:

1. Value of the land;
2. Size and shape of plot;
3. Legal restrictions;
4. Efficiency of architectural design and layout;
5. Building factors showing tendency to increase in cost as height is increased
   - (*a*) Structural steel,
   - (*b*) Elevators,
   - (*c*) Brickwork,
   - (*d*) Plumbing and water supply,
   - (*e*) Heating and ventilating,
   - (*f*) Electric light and power wiring,
   - (*g*) Total mechanical equipment,
   - (*h*) Permanent interior partitions, and
   - (*i*) Windows and glazing;
6. Building factors showing tendency to decrease in cost as height is increased
   - (*a*) Roofing,
   - (*b*) Excavations and foundations,
   - (*c*) Miscellaneous;
7. Building factors showing tendency to constant cost at all heights
   - (*a*) Interior finish,
   - (*b*) Concrete floors,
   - (*c*) Exterior finish;
8. Absorption of rentable area by elevators and other service facilities;
9. Level of construction costs;
10. Variations in rental value of floors at various heights;
11. Variations in operating costs at various heights.

The full report of the investigation will be published by the American Institute of Steel Construction in book form. This will include the details of the studies made, together with all the tables of calculations proving the results.

Inquiries may be addressed to the Institute at 285 Madison Avenue, New York.

FROM A LITHOGRAPH OF WASHINGTON SQUARE, NEW YORK, BY MILDRED E. WILLIAMS
SHOWN RECENTLY IN NEW YORK AS ONE OF THE "FIFTY PRINTS OF THE YEAR"

THE THIRD IN A SERIES OF CARTOONS BY ARTHUR F. BAER, DEPICTING HIGHLIGHTS OF ARCHITECTURE

The losers of every architectural competition accuse the judges of being drunk and weep over their decisions.

This department conducts four competitions each month. A prize of $10.00 is awarded in each class as follows: Class 1, sketches or drawings in any medium; Class 2, poetry; Class 3, cartoons; Class 4, miscellaneous items not coming under the above headings. Everyone is eligible to enter material in any of these four divisions. Good Wrinkle Section: a prize of $10.00 is awarded for any suggestion as to how work in the drafting room may be facilitated. No matter how simple the scheme, if you have found it of help in making your work easier, send it in. Competitions close the fifteenth of each month so that contributions for a forthcoming issue must be received by the twelfth of the month preceding the publication date in order to be eligible for that month's competitions. Material received after the closing date is entered in the following month's competition.
The publishers reserve the right to publish any of the material, other than the prize winners, at any time, unless specifically requested not to do so by the contributor.

THIS MONTH OUR HEADING is by C. Molinelli of Martinsville, Indiana. The drawing was submitted by Mr. Molinelli in our recent competition for a new heading for HERE AND THERE. It is our intention to use a different drawing each month to show our readers the excellence of many of the heading designs submitted in this competition.

G. C. Stone of Bristol, Virginia, carries off first honors in Class One with his sketch reproduced below. Arthur D. Roberts of Cambridge, Massachusetts, is the winner in Class Two. Fred Kock carries off honors in Class Three and Gerald Kaufman gets the ten dollars for Class Four.

Our old friend, "Doc" Caulstone, after a long silence. has sent in a poem which we are glad to print.

Mr. Charles A. Johnson, of Cass Gilbert's office in New York, has given us an idea by sending in the following experience with one of his clients. Such contributions as this will be welcomed by HERE AND THERE, and if you contributors like the suggestion, and prove it by sending in your stuff, we'll establish a monthly ten dollar prize for the most amusing anecdote.

Mr. Johnson writes: "I designed a house recently for a woman who was 'nouvelle riche,' as her husband acquired his riches during the war. When I was showing the sketches of the house to my client, she inquired whether or not I had provided a medicine cabinet in the bathroom.

"I told her that I had and showed it to her on the plan,

FROM A PENCIL SKETCH ON CAMEO PAPER BY G. C. STONE
(PRIZE—*Class One—March Competition*)

explaining that it was right over the lavatory. She looked at me and said, 'Wouldn't it be rather awkward to get at if it is over the lavatory?'

"I said that the medicine cabinet is always placed over the lavatory as that is the most convenient place for it.

"She replied with a haughty air, 'Well, in my apartment on Riverside Drive the medicine cabinet is over the wash basin.' "

For all of you that are out after bigger and better prizes, we refer you to pages 265 and 266 of this issue. Why not make a stab at winning a thousand dollars?

ODE TO EARLY SPRING

By "Doc" Caulstone, of Cambridge, Mass.

The first tee's in a snow bank
The second green's a flood
The third—a drive and iron shot
Is ankle deep in mud.

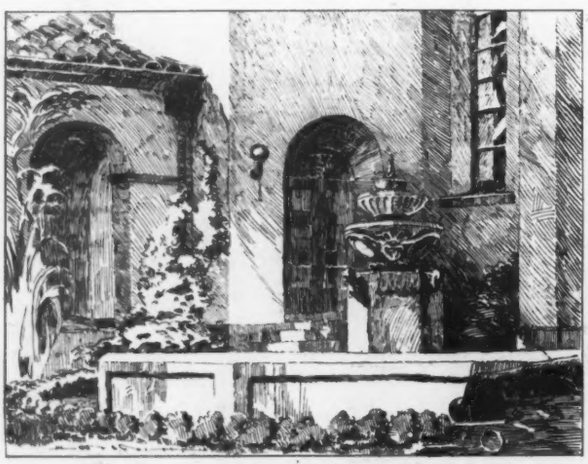
Oh, the clubhouse, the clubhouse
Stands empty now and chill
The thirsty hole the nineteenth
The clubhouse on the hill.

Along that second fairway
Flows the river dark and wet!
And balls I lost last summer
Must be lying down there yet.

But after March is over
And April has gone by
We'll see a little sunshine
We'll get a golfer's sky.

I've bought two dozen golf balls
And a driver that's a bird
And May will find me hitting
A sweet drive off that third.

Oh, Mac and Doc and Fordy
Will gather there once more,
And maybe, if I'm lucky
I can beat my last year's score.



PEN AND INK SKETCH BY W. DON SMITH, OF LOS ANGELES
Fountain, Church of St. Mary Magdalen, Camarillo, Cal.

A letter from Arthur D. Roberts gives the source of inspiration for his poem:

"In one of the classes at Massachusetts Institute of Technology—School of Architecture, the Professor said that the word 'architect' really means two distinct persons, that is, the designer of the æsthetic part of the building, and the designer of the engineering details. They both help plan specialized parts of the building, and yet an 'architect' is supposed to know all about both, in the popular notion.

"Thus, the Professor sought to make a finer distinction between these two types of architects by calling them archi-esthete and archi-gineer. I thought the words clever and quite to the point, and the enclosed poem [printed herewith] is the result."

UNITED THEY STAND

By Arthur D. Roberts

(PRIZE—*Class Two—March Competition*)

No architect's office is quite complete
Without an Archigineer and an Archiesthete.

Their work is united, and yet far apart,
For one cares for structure, the other for art.

The beautiful sketches, the castles in air,
Are the work of the esthete, the layman's despair.

He plans the cornice, the setbacks, the doors,
The color, the details, the texture of floors.

He says the lighting shall be soft and mellow,
Decides whether walls shall be brown, blue, or yellow.

Decorations he plans, for each room in his scheme,
And works day and night, 'til he's finished his dream.

When he's finished his sketches, the Archigineer
With sliderule and handbook, is needed, 'tis clear.

He figures, and searches through dry building codes,
Gets stresses and strains, and all total loads.

As the engineer figures, he starts to find fault,
And begins to think artists are not worth their salt.

"These spans are too long, these windows too small,"
But the Archiesthete will not change them at all.

So the engineer hears what the esthete has to say,
And finally agrees that 'twill look better that way.

Then he figures foundations, with piles through the silt,
And the beautiful dream of the artist is built.

Thus the building of beauty from the artist's trained hand,
Has the "bones," steel and concrete, the engineer planned.

Neither one could have done it, were he left alone,
For the esthete builds beauty, he's not skilled in "bone."

And the Archigineer should not deem it his part
To rival the esthete, whose forte is pure art.

To both some have tried, but never for long,
For one needs the other, so I still sing this song:—

No architect's office is quite complete
Without an Archigineer and an Archiesthete.

THE PROSPECK

(SOME NOTES ON THE HABITS OF A STRANGE, CURIOUS BIRD)

By Gerald Lynton Kaufman

(PRIZE—*Class Four—March Competition*)

THIS LITTLE WINGED CREATURE, of the genus *rara avis*, species *clientus possibilis*, is one of our most cherished native types of bird-life. The variety most often seen in the United States seems to have been evolved through a crossing of the Black and White Warbling Creeper with the Yellow-bellied Sapsucker, both well known members of the Woodpecker family. In fact the Prospeck itself was originally called the Prospecker, a word evidently derived from the root "Pro" now become a colloquialism for "Professional man," and the verb "to peck" or pick at. It is surprising that the exquisite coloring of its bright plumage never attracted Mr. Louis A. Fuertes to add it to his charming water-color studies, nor has Mr. Frank M. Chapman incorporated it in any of his famous works on ornithology.

The Prospeck has habits simliar to other members of the *clientus* family, but is more shy, more delicate, and harder to catch. It is generally found with its bill in the soft soil of vacant lots in sparsely settled areas, though it has been known to seek nesting-places in large cities as well. Like others of the feathered tribe, the male is far more brilliantly colored than the female, and sings the shriller song. The vibrant notes are used less to attract a mate, however, than to acquire a roost or perch; an odd circumstance which has given rise to the expression common to Prospecks, "Bought it for a song."

Apropos of the song of the Prospeck, it may be noted that while the female bird is known not only to chirp, but to crow and cackle as well, the male usually cuts in with his shrill cry whenever the female commences; it is a familiar cry, yet hard to render on paper. The nearest one can come to conveying the sound is as follows:—

"Cheep, cheep, cheep . . . . CHEAP!"

"Cheep, cheep, cheep . . . . CHEAP!"

The note of the bird—and we here refer to the musical note, not the promissory one—is a high treble sometimes continuing for weeks at a time, sometimes dying out very quickly in a mournful cry of despair. It can often be heard by the trained ear long before the bird itself has flown into view, and then it is that the trained ornithologist must exert all his tact and patience if he would get a snapshot, or what is more, a sketch. Decoys may be used, and often are, but seldom in the form of other Prospecks. Far preferable is it to show nests, eggs, perches, or brightly-colored feathers.

In this connection it is well to mention that it is useless to seek a Prospeck's egg for a decoy. No Prospeck's egg has ever been found. From a description written by one who has studied eggs of the *clientus possibilis*, the closest relative of the Prospeck, it may be inferred that the eggs are similar to those of the Fatu Liva Bird in form, but infinitely more volatile; while they are square when laid, they vanish or dissipate rapidly afterwards, often before the young have had a chance to hatch. The female neither lays the eggs nor sits on them; in fact they are too warm when first produced, and often go up in smoke immediately. It is seldom, therefore, that young Prospecks are brought to life from the eggs of the old. Yet the species is in no danger of extinction for it is frequently bred from other birds of the *clientus* flock, particularly when this flock is a large one.

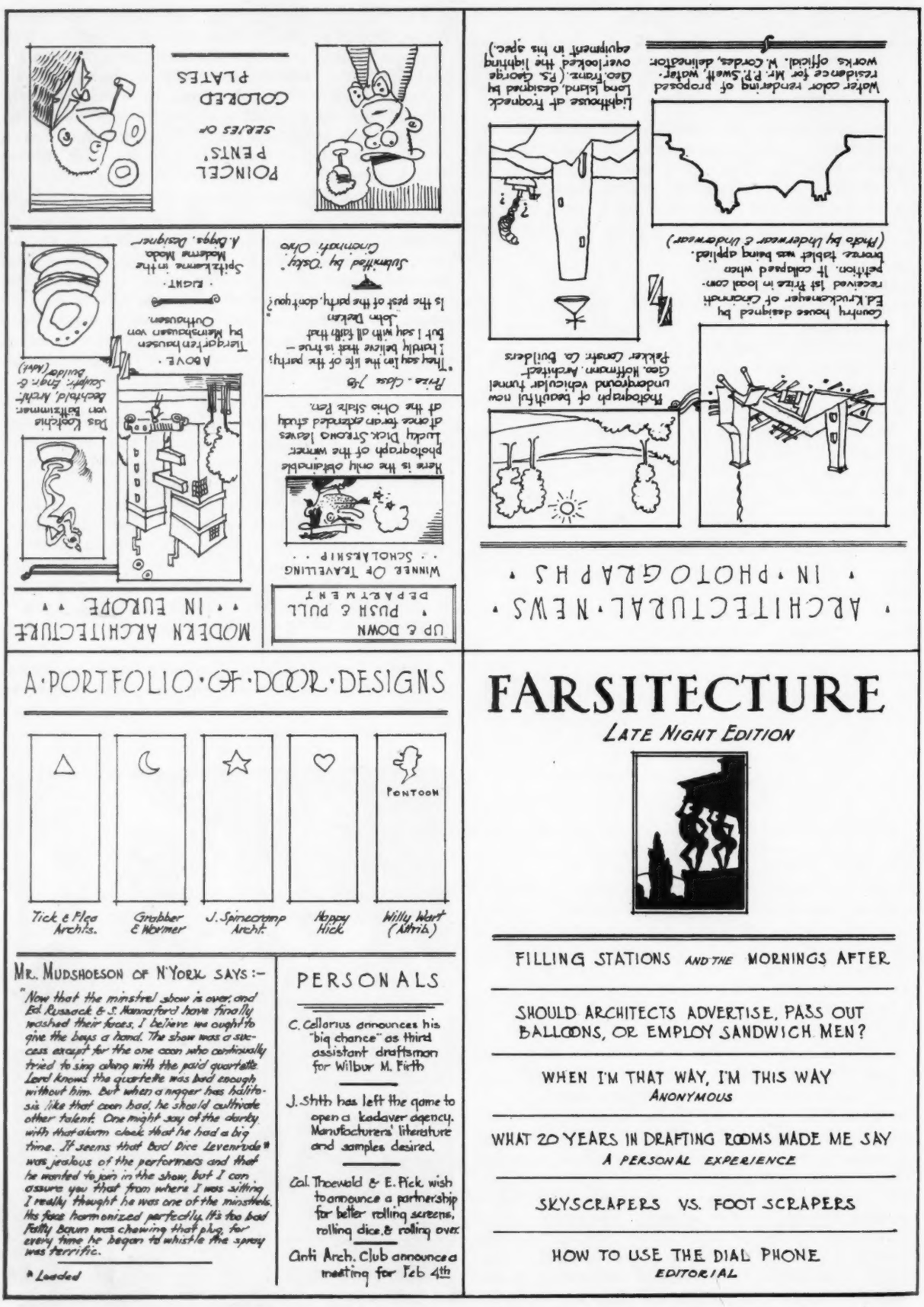
The Prospeck is a game-bird and also a bird-of-prey. Among certain peoples it is a sacred bird as well—or bird of pray. Sublime and often ridiculous acts of devotion are performed in its worship, and valuable offerings as well as human sacrifices are made to win its favor. Strangely enough, once the Prospeck is caught the bird changes its plumage with chameleon-like rapidity, becoming first a *clientus possibilis* and sometimes even the rarer species, *clientus veritabilis*. So that a live Prospeck, in captivity, is indeed an unusual thing to see.

This peculiar attribute of the bird, in changing its plumage, is often most disconcerting. Prospecks of the most glaring colors have been known to change to a deep blue while sketches were being made, and others, the morning after, have changed to a dull, dark brown. It would be imagined that this color-changing habit, combined with the disintegration of the eggs and the changing of species, would eventually bring about the extinction of the bird entirely. One important factor, however, mitigates against this.

While it is true that the Prospeck, once caught, changes its plumage, and while it is true that this often occurs after the mating season as well, it is nevertheless a daily occurrence among other members of the genus rara avis to change back again into Prospecks. This is particularly noticeable among *Clienti Veritabilis*. These latter have only too frequently been known to revert to Prospecks soon after being caught, and to fly away to parts unknown. The *clientus veritabilis* is the bird in danger of extinction. It is for this reason that an institute devoted to high-flying fowl is taking steps both for its preservation and domestication.

(Author's note and Adv. If any live Prospecks are seen or heard in your vicinity, and you wish further information, we will gladly furnish our address, telephone number, etc., etc., etc.)

LITHOGRAPH BY CLIFFORD N. BLACK, OF SALINA, KANSAS


POINCEL PENTS' SERIES OF COLORED PLATES
Water color rendering of proposed residence for Mr. P.P. Sweft. Water works official. W. Cordes, delineator.
Lighthouse at Fronack Long Island, designed by Geo. Franz. (P.S. George overlooked the lighting equipment in his spec.)
Country house designed by Ed. Kruckemeyer of Cincinnati received 1st Prize in local competition. It collapsed when bronze tablet was being applied. (Photo by Underwear & Underwear)
Photograph of beautiful new underground vehicular tunnel Geo. Hoffmann, Architect Pekker Constr. Co. Builders
ARCHITECTURAL·NEWS·IN·PHOTOGRAPHS
UP & DOWN PUSH & PULL DEPARTMENT
WINNER OF TRAVELLING SCHOLARSHIP
Here is the only obtainable photograph of the winner. Ludy Dick Strong leaves at once for an extended study at the Ohio State Pen.
Prize - Class 7B
"They say I'm the life of the party; I hardly believe that is true — But I say with all faith that I am the pest of the party, don't you?"
John Dekker
Submitted by "Osky" Cincinnati, Ohio
MODERN ARCHITECTURE IN EUROPE
ABOVE. Tiergarten Hausen by Meinshausen von Outhausen.
RIGHT. Spitzlamm in the Moderne Mode A. Dyga, Designer
Das Loethe von Baltzimmer. Architect: Engr. & Builder (Ach!)
A·PORTFOLIO·OF·DOOR·DESIGNS
PONTOON
Tick & Flea Archits.
Grabber & Worimer
J. Spinecramp Archt.
Happy Hick
Willy Wart (Attrib.)
MR. MUDSHOESON OF N'YORK SAYS:—
"Now that the minstrel show is over, and Ed. Russack & S. Hannaford have finally washed their faces, I believe we ought to give the boys a hand. The show was a success except for the one coon who continually tried to sing along with the paid quartette. Lord knows the quartette was bad enough without him. But when a nigger has halitosis like that coon had, he should cultivate other talent. One might say of the darky with that alarm clock that he had a big time. It seems that Bud Dice Levenrode* was jealous of the performers and that he wanted to join in the show, but I can assure you that from where I was sitting I really thought he was one of the minstrels. His face harmonized perfectly. His foot Fatty Baum was chewing that plug for every time he began to whistle the spray was terrific.
* Loaded
PERSONALS
C. Cellarius announces his "big chance" as third assistant draftsman for Wilbur M. Firth
J. Shtth has left the game to open a kadaver agency. Manufacturers' literature and samples desired.
Col. Thoewald & E. Pick wish to announce a partnership for better rolling screens, rolling dice, & rolling over.
Anti Arch. Club announces a meeting for Feb 4th
FARSITECTURE
LATE NIGHT EDITION
FILLING STATIONS AND THE MORNINGS AFTER
SHOULD ARCHITECTS ADVERTISE, PASS OUT BALLOONS, OR EMPLOY SANDWICH MEN?
WHEN I'M THAT WAY, I'M THIS WAY
ANONYMOUS
WHAT 20 YEARS IN DRAFTING ROOMS MADE ME SAY
A PERSONAL EXPERIENCE
SKYSCRAPERS VS. FOOT SCRAPERS
HOW TO USE THE DIAL PHONE
EDITORIAL

DESIGNED AND DRAWN BY FRED KOCK OF THE OFFICE OF TIETIG AND LEE, ARCHITECTS

Blue prints of this were sent to members of the Cincinnati Architectural Club as an announcement of a club meeting.

(PRIZE—*Class Three—March Competition*)

THE SPECIFICATION DESK

A Department for the Specification Writer

ROOFS AND ROOFING MATERIALS—2

By David B. Emerson

AFTER SHINGLE, SLATE, and tile, probably the most popular types of roof coverings are the various sheet metal roofings —tin, copper, lead, zinc, and Monel metal—all of which can be used equally well on sloping or flat roof surfaces. The so-called "tin plate" used for roofing is a black plate, either a copper bearing steel, or a ferrous alloy coated with a mixture of lead and tin, called by the trade a "terne" plate. Tin makes a good roof if properly cared for; it should be painted on the under side before laying and painted at least two coats on all exposed surfaces after laying. Painting should be done with red lead, iron oxide or metallic brown, mixed with pure linseed oil. Copper is an excellent roofing material and if properly laid it will last as long as the building; some copper roofs in Europe have lasted for two and three centuries, and roofs in China and Japan are claimed to have lasted over five centuries. Only soft or roofing temper copper should be used, and experience has proven that sixteen ounce is the proper weight to use.

In addition to the regular sheet copper, a new material, lead covered copper, is now being used for roofing, flashing, gutters, and leaders. It looks like sheet lead, but is much lighter, is easier to handle and to support and it does not dent and damage as easily. It comes in a rough or old English finish which looks like a weathered sheet lead, and in a smooth finish. I have tried to scrape off the lead coating and expose the copper and found it impossible, so it is fairly safe to say that it will stand up under any ordinary service.

Lead has been used for centuries as a roof covering; in England it was recorded by Bede in 638 that the roof of the church at Lindisfarue was covered with lead, and in later years many of the cathedrals and great houses had lead covered roofs. It makes a very good and lasting roof, and being the least resonant of metals is practically noiseless. The only fault which lead has, so far as I know, is that it is inclined to crawl with the heat, and to settle toward the low points of the roof. Hard lead which is an alloy of lead and antimony, the antimony content varying up to twelve per cent., has not the faults of sheet lead as it does not crawl nor distort with heat, and is stiff enough to stand up quite as well as the harder metals.

For roofing or flashings either with sheet lead or hard lead, three pound lead should be used and for cap flashings two and a half pound lead may be used. Zinc is a good roofing material and has been in use in Europe for over a century, principally in Belgium and France; the Amiens Cathedral was re-roofed with zinc about sixty years ago.

In this country zinc roofs were laid as far back as the late '50's, and some of them are still in good condition. Zinc is a non-corrosive metal so needs no painting, and after a short exposure to the weather becomes a pleasing gray, deepening with age to a slate color. Next to lead zinc is the least resonant of metals, consequently it makes a practically noiseless roof. The only precaution to use in laying a zinc roof is never to lay it when the temperature is below 40° Fahrenheit, as zinc becomes brittle in cold weather and is liable to break in handling.

Monel metal is an alloy of copper and nickel, is harder and stronger than copper, and resists corrosion better than copper and most other metals. It was used on the Pennsylvania Railroad Station in New York, and has given wonderful satisfaction so far. The only reason it has not been used more frequently is the comparatively high cost.

There are two methods of applying sheet metal to sloping roof surfaces. These are the standing seam method, and the ribbed seam method. In the standing seam method the edges of the sheets are bent up, and double locked together with the seams running vertically, and the metal is secured to the roof sheathing by means of cleats spaced eight to ten inches apart, locked into the seam and nailed to the roof. Standing seam roofing may be used on any type of sloping roof, where the slope is not less than three inches to a foot, but should never be used on flat roofs, as the seams being unsoldered are not watertight. In the ribbed seam method wood ribs or battens, usually two inches square with the sides bevelled about one eighth inch, are nailed to the roof sheathing (or secured to the fireproof roof slab). The sheets are laid between the ribs, with the edges turned up, and the sheets are fastened to the ribs with cleats spaced eight inches apart. The ribs are covered with sheet metal caps, and the edges of the caps and the edges of the sheets are locked together. This method of roofing is generally used on large buildings of a monumental character. For all flat roof surfaces, that is roofs having a slope of not over three inches to the foot, if metal roofs are desired, flat seam roofing should be used. Flat seam roofing should be laid with small sheets of metal, about 18″ x 24″, with one half inch seams flat locked and soldered, and each sheet should be held in place with metal cleats locked into the seams, using not less than four cleats to a sheet. All metal roofs should be specified to have all surfaces covered with rosin sized or asbestos building paper weighing not less than 6 pounds per 100 square feet, before laying the metal roof. All joints in paper, both horizontal and vertical, should be lapped at least two inches, and be nailed with large flat head nails.

All nails used for tin roofs should be zinc coated, those used for zinc either zinc coated or cut zinc, and for lead or copper roofs should be copper. Under no circumstance should nails be driven through the metal sheets.

In addition to the various types of covering for sloping roofs already described, there are numerous forms of asbestos shingles, composition shingles, and metal tiles and shingles on the market, all of which make excellent roof coverings both as a matter of utility and as a matter of looks. Nearly all, if not all, of these various forms of

shingles and tiles are patented and are sold under trade names, and should be applied according to the directions issued by the manufacturers. For flat roofs, that is roofs having a slope of from one half inch to two inches to one foot, the built up roof is probably more extensively used than any other type. Built up roofs are of three general types: coal tar pitch or natural asphalt and felt with a protective coating of either granulated blast furnace slag or gravel, asphalt and felt with a special asphalt surfacing, and coal tar pitch or natural asphalt and felt with a covering of promenade tile, slate slabs, or brick.

The old reliable tar and gravel (or slag) roof is undoubtedly the most popular as well as the oldest type of built up roof. This type of roof is only good for a slope of two inches to one foot when laid over sheathing boards, and one inch to one foot when laid over concrete or other fireproof slabs, for slopes of over two inches and not exceeding six inches to one foot, natural asphalt and gravel (or slag) should be used. The highest grade of tar and gravel roofs are a five ply roof laid over sheathing boards or a four ply roof laid over a concrete roof slab. At least one company gives a twenty year guarantee bond on these roofs. A four ply roof laid over sheathing boards or a three ply roof laid over a concrete slab is a good roof, and will be guaranteed for ten years by any reliable roofer. In specifying tar and gravel (or slag) roofs on boards, one thickness of sheathing paper or unsaturated felt, weighing not less than 5 pounds per 100 square feet, should always be laid on top of the sheathing, lapping the sheets at least one inch and nailing with large head nails. This is what roofers in some sections of the country call a "dry sheet," and it prevents the pitch running through the boards when the roof is laid.

In specifying the high grade four or five ply bonded roof, all that is necessary is to use the manufacturer's short form of specification and the roof will be properly laid, and the bond properly delivered. If a three ply roof on concrete or a four ply roof on sheathing boards is to be laid on a competitive bidding basis, always specify that the felt should weigh not less than 14 pounds to 100 square feet, that it should be lapped not less than twenty-two inches on concrete slabs, and not less than seventeen inches on boards and should be well bedded in pitch, and that felt should not touch felt. Also, specify that for a three ply roof on concrete not less than 175 pounds of pitch, and 400 pounds of gravel or 300 pounds of slag ¼ inch to ⅝ inch size should be used, and for a four ply roof on boards not less than 125 pounds of pitch, and 400 pounds of gravel or 300 pounds of slag should be used.

The smooth surfaced asphalt roofs are built up similar to the gravel coated roofs, except that the surface is given a protective coat of specially prepared asphalt, which is, so far as I know, a more or less secret process and is protected by patents, each manufacturer having a trade name for his product. In specifying this type of roof, always use the manufacturer's short form of specification.

With the built up roof, as with all other forms of roofing, one of the great essentials in securing a watertight roof is the flashing. Flashing may be done in one of two ways, either the time honored metal flashing, or the newer built up flashing laid by the roofer as a part of the roof may be used. Metal flashings may be of galvanized sheet iron, tin, copper, lead, or zinc. The most approved method of flashing with metal at the present time is to lay three layers of felt saturated with pitch at the junction of the roof and the vertical wall extending six inches up on the wall, and out over the roofing felt, to lap the felt six inches, five inches, and four inches respectively. Over this felt bend the metal base flashing, which should extend at least six inches out on the roof and at least five inches up on the wall. When laid over board sheathing, the flashing should be nailed at the edge every six inches. Two plies of felt at least fifteen inches wide, and cemented together with hot pitch should be laid over the horizontal lap of the base flashing and cemented to the roofing felt. The base flashing should be cap flashed, and the cap flashing should turn down four inches over base flashing and should be carried through the entire thickness of the parapet wall.

The patent built up flashing should either be caulked into a reglet formed in the brick work or into a special type of flashing block with the reglet formed in the block. If patent flashings are used a metal strip as wide as the parapet wall should be built into the wall, one course above the reglet, to stop seepage water from entering the wall below the roof. Leader outlets on flat roofs should be of the dome type, as the sunken type of roof sump frequently gets covered with dead leaves and rubbish, and becomes clogged or a sheet of newspaper may fall over it and successfully stop it up, whereas the dome type of outlet will function when several inches of foreign matter have accumulated around the base of the dome.

The built up coal tar pitch or asphalt roof with a covering of promenade tile, slate slabs, or brick, is the most expensive, as well as the highest type of roofing used on flat roof surfaces. This type of roof should be used on roofs which are to be walked on to any extent, and on all roofs where windows look out on the roof, such as roofs at the bottom of light courts and at set backs. In laying these roofs a five ply felt and pitch or felt and asphalt waterproofing the same as for a gravel or slag roof should be laid. Immediately before the tile is laid, this waterproofing should be given a uniform coating of pitch or asphalt. The tile or slate slabs should be set in not less than ¾ inch of cement mortar with joints 3/16 inch to ¼ inch wide and grouted with one to two cement grout.

Brick as a roof covering is very seldom if ever used now, but was quite common some years ago for promenade roofs where heavy traffic was liable to occur. If bricks are to be used they should be a paving brick laid flat to decrease the dead load. It is very necessary in laying promenade tile, slate slab or brick roofs to provide proper expansion joints at regular intervals in the roof surface (not much more than twenty feet apart), and at all walls. Expansion joints should be at least one inch wide and filled with a non-hardening asphaltic mastic or a plastic cement.

An excellent precaution against possible future trouble with built up roofs is to specify scuppers in the parapet walls, they may never be needed, but if the leader outlets should ever be stopped up, there will be no damage caused by the flooding of the roof. Another very good practice in the construction of built up roofs which is becoming quite general, is insulating between the roof slab and the felt and pitch. Any one who has ever worked in the Summer in a drafting room on the top floor of a building with an uninsulated roof will agree with me that it is at least a humane practice, to say nothing of the fact that it is rather an expensive practice to burn up coal to provide heat to melt the snow off the roof. Quite a number of different forms of insulating materials are available, among which are cork boards, and a number of other boards made from different materials such as licorice roots, sugar cane fiber, specially treated wood fiber, peat moss, flax fiber and other materials which produce a cellu-

(Continued on page 86, Advertising Section)

MODERN SPECIFICATIONS FOR PAINTING

By William J. Miskella
Director of Finishing Research Laboratories, Inc.

TIMES HAVE CHANGED the time-worn method of specifying paints, varnishes, lacquers and other finishing materials used in the building trade. After many years of alternating between attempts to specify the chemical formula and omitting the formula and mentioning only the fact that certain well-known trade brands shall be delivered to the job in sealed containers, the architect is at last provided with a means whereby he may get what he specifies.

When the architect stops to analyze the facts he is more than likely to come to the conclusion that it is just as well for him not to try to know much about the composition of paints and other finishing materials. Take steel, for example; it is common practice to specify the chemical content, tensile strength and so on. It must be done if the architect is to be sure that the building will stand up under all conditions. But when one talks about the chemical contents of the various finishing materials he immediately gets into hot water because of the great variety of raw materials used and the wide limits which mark each one of these items.

In steel it is carbon and iron. In paints it is several kinds and grades of oils; a large number of different kinds of pigments; a limited list of driers and an endless list of thinning or reducing materials. Pray tell how can the architect be expected to know the characteristics of the various items in the list in detail, and the effect that each one has on the resultant material when the experts within the paint manufacturing industry do not agree?

Architects have been widely criticized for their adherence to the old standby—lead and oil mixed on the job for outside painting, for example. The question is also often asked, "Is this criticism justified?" I am inclined to feel that it is not. Not after a person has been disappointed several times and fails to get what he specifies in the way of a desirable finish. Especially when he has placed confidence in a certain brand that has been presented to him, along with a lot of sales points to win his interest, and he later finds that this factory-mixed material failed to support the reputation given it.

Of course, every one connected with the building industry will admit that every effort is made to reduce the prices of steel, cement, lumber, trim, and so on, by eliminating hand labor with the substitution of modern machinery. Even automatic machinery is used wherever it can be introduced to cut the cost which in turn tends to lower the selling price. Hand wrought iron parts, for instance, are sometimes used for high class hinges and decorative hardware, but when steel is used it is machine made.

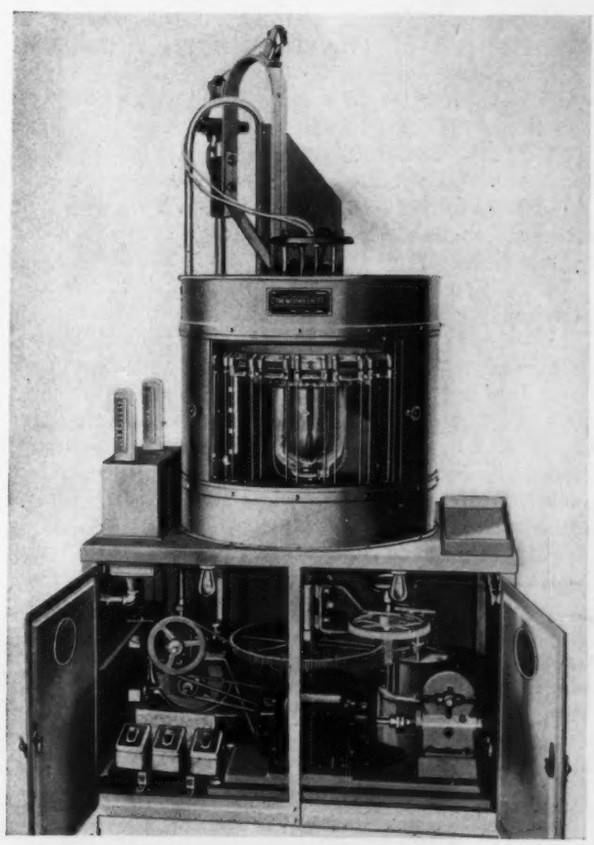
This is not so in the case of exterior paints when lead and oil are specified. The architect actually forces the painting contractor to do hand mixing on the job. The lead is delivered in iron kegs and the oil in tin cans. There are certain prescribed steps necessary in the mixing procedure of these two important elements of exterior paints but they are not always properly followed. When they are *not* properly mixed the coating will not do justice to the pure ingredients used by the painting contractor, as directed in the specification.

Generally speaking the greatest fault lies in the insufficient amount of labor used to mix the lead and oil thoroughly. Naturally a painter will not spend any more time than he really has to in performing the unpleasant task of hand mixing. He will apply the material which he mixes when he thinks he has it in the proper condition to be brushed or sprayed satisfactorily. Months afterwards the owner will enter a complaint but then it is too late, for the contractor has been paid and there is no recourse. One need only to observe the painted surfaces as he walks along the street to note the variation in the different work. In some cases there will be coarse brush marks, in others there will be uneven streaks and spots. In many instances the appearance of the surface might be overlooked if the paint lasted satisfactorily but generally it does not.

Just what is this modern method that might be used in specifying paints? What can the architect do to overcome this hand-mixing and still have the assurance that he is getting quality material? There are two ways in which this may be handled. One is for the architect to have comparative tests made—comparative between what he knows is right and that which he wishes to be sure about. The other way is for the architect to specify "that the paints that are to be used and the method of application shall be acceptable to——", naming whatever firm, or expert, he may wish to supervise that part of the work.

In the comparative test suggested the theory is that the architect knows of a certain material that will do the work to his satisfaction. That particular material may be his favorite and so may be called his "standard." Along comes an advertisement, a letter, or a salesman who offers something better—it may be a ready-mixed paint—it looks

(Continued on page 86, Advertising Section)



MACHINE USED FOR TESTING PAINTS

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THE MART

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MODERN SPECIFICATIONS FOR PAINTING

(Continued from page 315, Editorial Section)

good, but the architect hesitates to deviate from past practices. Everything sounds fine but nothing is certain as to final results.

If the architect really wants to know if the proposed new material is as good as that which he has been using all he has to do is to have an accelerated comparative test made between the two grades of paint. He may even have the test made on a group of five or six samples. When the test is finished and the results are tabulated in an engineering report then the true story will be known and the possibility of having established a new standard will have been considered.

In making these comparative tests the competitive samples are sent to the laboratory under secret code numbers. When the architect receives the engineering report he also receives actual sample panels made under laboratory conditions so he may see, with his own eyes, just what these tests have determined.

It is not necessary to go into detail regarding the construction of the rather expensive and highly scientific machine upon which such tests are run. Rather let it be understood that a number of things are done simultaneously to the samples under test to make them break down and that the average length of time required to make these tests is seventeen days and nights, or 400 continuous hours. During this period the meritorious samples survive the rigorous treatment whereas the weak ones break down very quickly. Thus it is a proven fact that it is no longer necessary for the architect to take anybody's word regarding the quality of a painting material. It is possible, with the aid of these accelerated comparative tests, for him to learn *all* the facts necessary regarding finishing materials just as he learns about steel and cement by similar methods.

Once the material question is settled there is another point that is largely overlooked by architects. I refer to the application of the specified materials after they have reached the job and are reported by the inspector to be in accord with the specifications covering that particular part of the work. There are all sorts of variables that enter into the matter after this. Principal among them are the kinds of reduction solvents used and the method of thinning. Closely following these are the kinds of driers added to the paints to make them dry quickly and properly.

An architect would have to become a journeyman painter before he could know all the tricks of the trade and be able to specify just exactly what should be done. The unfortunate part of it is that he would soon become out-of-date in his methods if he failed to keep up his practice, for new methods and new materials are evolved almost every day in the scientific laboratories of the painting industry. A wide awake architect desires to keep up-to-date on these matters but he can hardly do so without spending too much time on them, due to the ever changing conditions of the industry.

Lacquer is an example of this. It is just beginning to obtain a foothold in the building industry and yet there are few architects who know much about lacquer and its possibilities. No doubt this fact is responsible for the hesitancy of the building trade in accepting lacquer as a finishing material.

Anyway, the comparative testing idea given herein will aid in determining the best finish, whether it be paint, varnish, lacquer or whatnot. There is one caution regarding comparative tests that should be mentioned. The tests are of no practical value if one of the interested companies is going to run the tests, as so many unscrupulous ones offer to do free of charge. These tests can be made by an independent laboratory but for not much less than $25.00 per sample and about $18.00 of this represents actual operating costs. Nearly all paint companies have their own testing machines, the same as the ones herein mentioned. They use them in determining just how their own materials rate with others—for their own information. Thus there is only one sure way to get an impartial test made and that is to send the unidentified samples to an impartial laboratory equipped to do the work. A laboratory should be selected that will have no interest whatsoever in the test. Due to the blindfold nature of these accelerated comparative tests it is thought that a paint company can make an impartial test without knowing that their own material is included. This is a great mistake for there are many ways of learning which one of the group is the one that is to be favored and it would be by the wildest stretch of imagination that a company would test its own material competitively and turn in a written report to that effect.

ROOFS AND ROOFING MATERIALS

(Continued from page 314, Editorial Section)

lar structure. The usual method of applying the insulation is to coat the roof surface thoroughly with hot pitch or asphalt, the thicker the better, and bed one thickness of the insulating board in this, then coat the board with pitch or asphalt bedding the second thickness of insulating board, breaking all joints in both directions, then mop with pitch or asphalt and lay the roof in the usual manner.

The flat slate roof which is coming into favor at the present time is a good type of hard surfaced roof which is not so expensive as to be prohibitive and gives good service. In laying a flat slate roof, the roof surface should be waterproofed the same as for a tar and gravel roof, with four or five plies of pitch and felt, and then well mopped with a bedding compound, either a mixture of 60% coal tar pitch and 40% Trinidad asphalt, or 50% coal tar pitch and 50% Trinidad asphalt, or even pure asphalt is sometimes used. The slate should be well pressed into this bedding compound. All slate should be at least ¼ inch thick and not over 12″ x 12″, and even smaller sizes are more satisfactory. This type of roof naturally will not stand the traffic the promenade tile roof will stand, but it makes a good smooth surface that can be swept off and kept clean.

Another type of roof for covering flat decks, and one which is unlike any of the roofs previously described in any of its general characteristics, is the canvas roof. This type of roof is largely used on residential buildings for covering the roofs over porches, the floors of sleeping porches which occur over rooms, and other roof surfaces where a noiseless roof which can be walked on is desired. In laying canvas roofs either a regular twelve ounce cotton duck or a specially prepared bitumen soaked cotton duck may be used, and I have seen good results from both. The manufacturers of the prepared duck claim the plain cotton duck is subject to rot and attacks of the mildew germ, also that oil in paint burns the cotton fiber. Untreated canvas should be well wet before laying, but treated canvas should be laid without wetting. Canvas should be bedded in white lead, thinned with linseed oil. All seams should be lapped not less than 1½ inches, and should be tacked with tinned carpet tacks or copper tacks, spaced four inches apart on the lower edges and ¾ inch apart on the upper edges. Canvas should be carried up on all

(Continued on page 168, Advertising Section)

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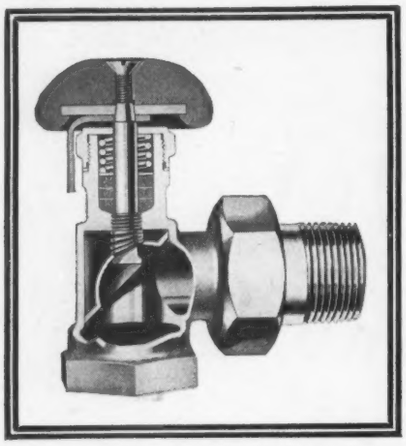

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ROOFS AND ROOFING MATERIALS

(Continued from page 86, Advertising Section)

walls and counterflashed with metal. After laying plain canvas should be well soaked with boiled linseed oil and then given two or three coats of white lead and boiled linseed oil paint. Prepared canvas should be given two coats of white lead and oil paint. In addition to the various roofings already described there are a number of "ready roofings" and "roll roofings" on the market. These materials are all very good in their place, that is on temporary buildings, low cost country houses, cattle sheds, chicken coops and buildings of that type, but I could not consistently advise their use on the class of buildings which an architect is called upon to build.

The object of this article is to give a general summary of the various roofing materials in use at the present time with no desire on my part to advocate the use of any particular roof, nor to show the superiority of any one material over another, but to give the young specification writer some idea of what he has to choose from, and leave it to his own judgment to make that choice.

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